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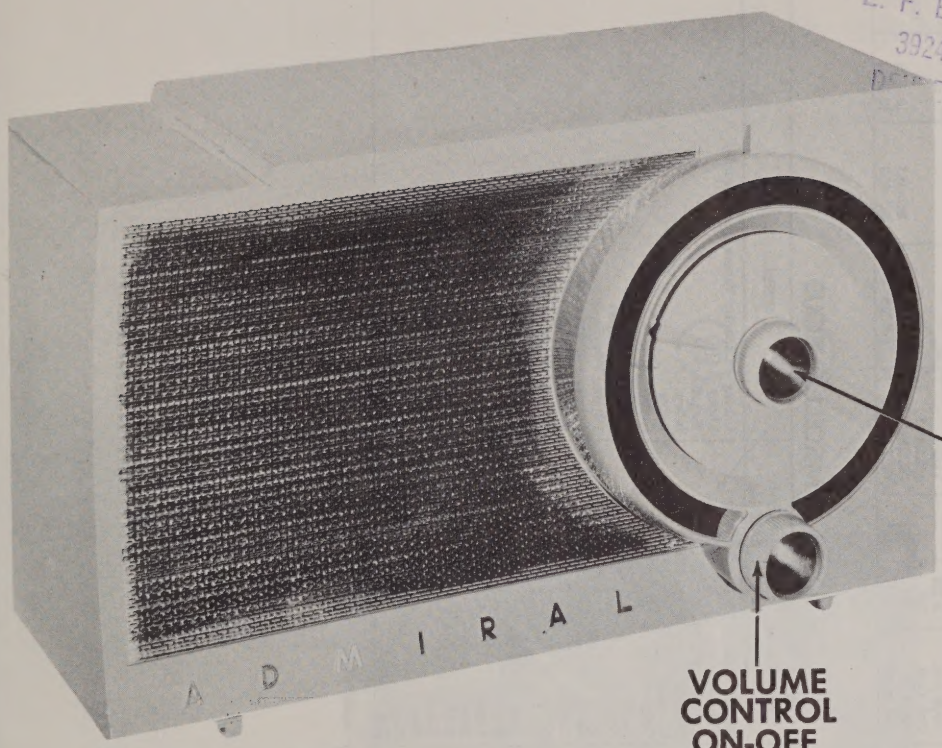

ADMIRAL
CHASSIS 5T3

TRADE NAME	Admiral Models 5T31, 5T32, 5T33, 5T34, 5T38 (Ch. 5T3)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Ill.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC — RATING .21 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~ Mod)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1620KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

ADMIRAL
MODEL 5T31 (Ch. 5T3)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	Det-AVC-AF Amp.	12AV6	12AV6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ADMIRAL PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	■50	150	67C30-1			FP213	TM-5030-150	D-065	
B	▲30	150							
C2	10000		65C10-3	DD-103	811-01	DC511			
C3	10000		65C10-3	DD-103	811-01	DC511			
C4	47		65C6-79	TCZ47	NP0-338-470	ZT-5447			
C5	.05	200	64A12-1					360003	
C6	10000		65C10-3	DD-103	811-01	DC511			
C7A	220		♦						
B	5000								
C	5000								
D	250								
E									
C8	10000		65C10-3	DD-103	811-01	DC511			
C9	.047	400	64B17-28	DF-503		PT4147	IMP4-S47	3304147	

♦ Items C7A, C7B, C7C, C7D, C7E, R5A, R5B and R5C are combined in one unit.
When replacing C-R unit with separate items, C7D and C7E should total 250MMF.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ADMIRAL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1Meg	½	75C25-3					Volume & Switch

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ADMIRAL PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	22KΩ	½	60B8-223	BTS-22K	
R3	100Ω	½	60B8-101	BTS-100	
R4	2.2Meg	½	60B8-225	BTS-2.2Meg	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ADMIRAL PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R5A	6.8Meg	½	♦	BTS-6.8Meg	
B	470KΩ	½		BTS-470K	
C	470KΩ	½		BTS-470K	
R6	150Ω	½	60B8-151	BTS-150	
R7	1200Ω	2	60B14-122	BTB-1200	

♦ Items R5A, R5B, R5C, C7A, C7B, C7C, C7D and C7E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: ADMIRAL PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	2.1KΩ	3.1Ω	Part of speaker	A-3876	A-2928	S-2X	Z1102 ①	24S50	① Tape primary tap.

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

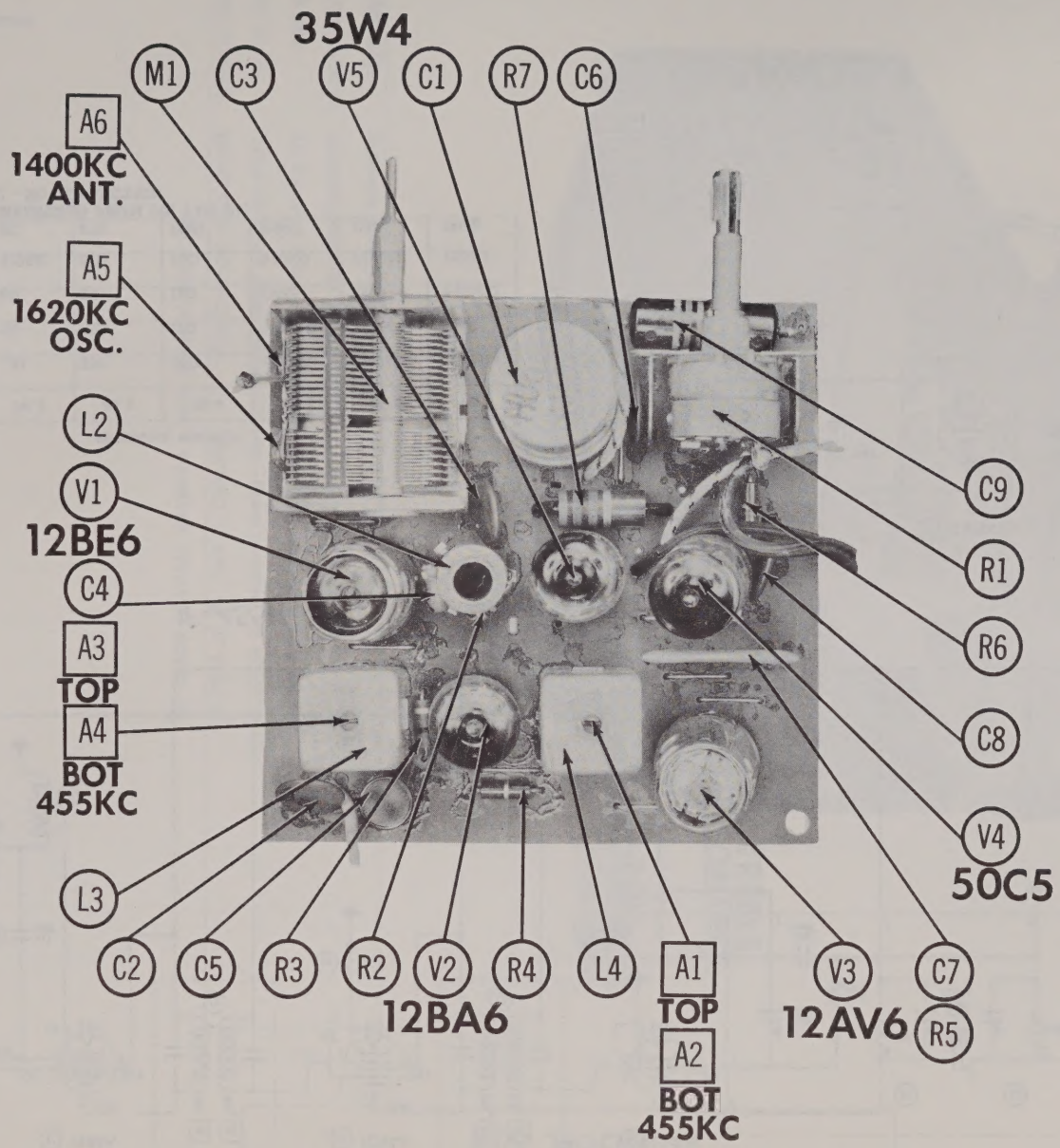
ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: ADMIRAL PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	6"	PM	3.1Ω	78B100-1	ST-109 Mod. P6-W	6A21	

COILS (RF-IF)

ITEM No.	USE	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Loop Ant.	3.2Ω		A4629				
L2	Osc. Coil	7Ω		69A190-2				Tapped at .7Ω
L3	Input IF	15Ω	15Ω	72C28-65	16-6758	BC-352	13-PC1	
L4	Output IF	15Ω	15Ω	72C28-65	16-6758	BC-353	13-PC2	

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M1	Tuning Cap.	68B64-2	2 Gang - Capacity Values Unobtainable
	Cabinet	34D82-1	Ebony
	Cabinet	34D82-2	Maroon
	Cabinet	34D82-3	Ivory
	Cabinet	34D82-4	Beige
	Cabinet	34D82-5	Green
	Knob	25B61-1	Pointer - Ebony
	Knob	25B61-2	Pointer - Maroon
	Knob	25B61-3	Pointer - Ivory
	Knob	25B61-4	Pointer - Beige
	Knob	25B61-5	Pointer - Green
	Knob	33C141-2	Tuning - Ebony
	Knob	33C141-4	Tuning - Maroon
	Knob	33C141-6	Tuning - Ivory
	Knob	33C141-8	Tuning - Beige
	Knob	33C141-10	Tuning - Green
	Knob	33C141-1	On-Off-Volume - Ebony
	Knob	33C141-3	On-Off-Volume - Maroon
	Knob	33C141-5	On-Off-Volume - Ivory
	Knob	33C141-7	On-Off-Volume - Beige
	Knob	33C141-9	On-Off-Volume - Green
	Dial Scale	21B81	



CHASSIS TOP VIEW

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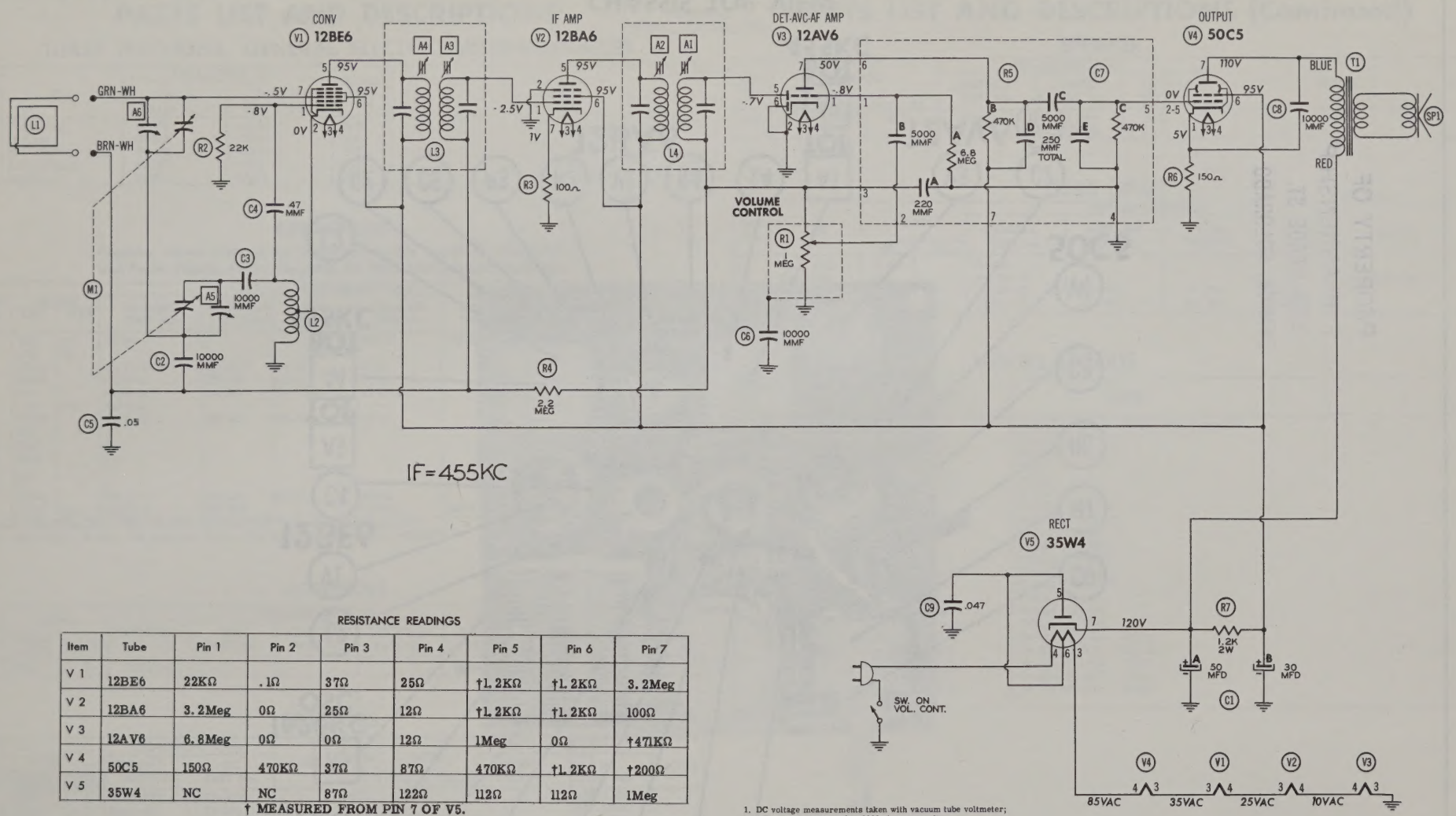

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.1Ω	37Ω	25Ω	†1.2KΩ	†1.2KΩ	3.2Meg
V 2	12BA6	3.2Meg	0Ω	25Ω	12Ω	†1.2KΩ	†1.2KΩ	100Ω
V 3	12AV6	6.8Meg	0Ω	0Ω	12Ω	1Meg	0Ω	†471KΩ
V 4	50C5	150Ω	470KΩ	37Ω	87Ω	470KΩ	†1.2KΩ	†200Ω
V 5	35W4	NC	NC	87Ω	122Ω	112Ω	112Ω	1Meg

† MEASURED FROM PIN 7 OF V5.
NC - NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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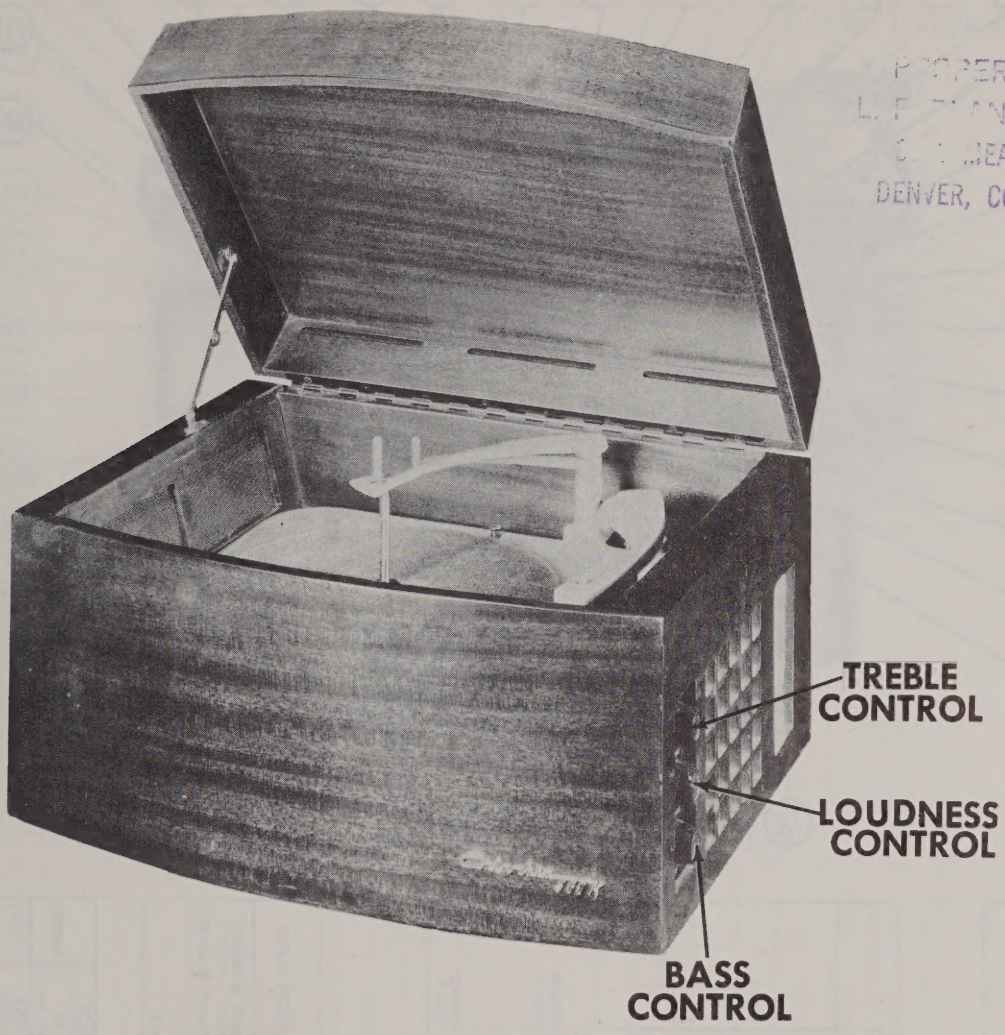
COLUMBIA RECORDS
MODEL 324



COLUMBIA RECORDS
MODEL 324

TRADE NAME	Columbia Records Model 324
MANUFACTURER	Columbia Records, 799 Seventh Ave., New York 19, N.Y.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Automatic Record Changer
TUBES (Four)	Types 12AX7 AF Amp., 12AX7 AF Amp.-Phase Inverter, (2) 6V6GT Output
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .1 Amp. @ 117 Volts AC

RECORD CHANGER UNIT - WEBSTER CHICAGO MODEL 113

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

COLUMBIA RECORDS
MODEL 324

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		Columbia Records PART No.	STANDARD REPLACEMENT		
V1	AF Amplifier	12AX7	12AX7	9A	
V2	AF Amp.-Phase Inverter	12AX7	12AX7	9A	
V3	Audio Output	6V6GT	6V6GT	7S	
V4	Audio Output	6V6GT	6V6GT	7S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT	Columbia Records PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1	40	150				TC48	TD-40-150	FM-1540	
C2A	▲40	150				FP369.1	TM-3059	T-725	
B	▲40	350							
C	■40	350							
C3	40	150				TC48	TD-40-150	MT-1540	Note 1
C4	.05	200		DF-503		PT415	IMP2-S5	330215	
C5	.001	600		D6-102	GP2L-102	PT625	IMP6-D1	330121	
C6	.05	200		DF-503		PT415	IMP2-S5	330215	
C7	.003	600		D6-302	GP2-333-202	PT623	IMP6-D3	330623	Note 2
C8	.05	200		DF-503		PT415	IMP2-S5	330215	Note 3
C9	2000			DD-202	801-002	DC-522		C-1220	
C10	10000			DD-103	811-01	DC-511			
C11	10000			DD-103	811-01	DC-511			
C12	390			D6-391	GP2K-391	UC-5339		K-1339	
C13	390			D6-391	GP2K-391	UC-5339		K-1339	
C14	.05	200		DF-503		PT415	IMP2-S5	330215	
C15	250	500		D6-251	GP2K-251	MC240		K-1325	Note 3
C16	.05	200		DF-503		PT415	IMP2-S5	330215	Note 4
C17	.1	400		DF-104		PT401	IMP4-P1	330401	
C18	.1	400		DF-104		PT401	IMP4-P1	330401	
C19	.01	400		D6-103	GP2-333-103	PT411	IMP4-S1	330411	
C20	.01	400		D6-103	GP2-333-103	PT411	IMP4-S1	330411	
C21	.0047	400		D6-472		PT6247	IMP6-D47	3306247	Note 3
C22	.06	400				PT616	IMP6-S6	330616	Note 3

Note 1. Some versions may use a 30MFD capacitor in this application.
Note 2. Some versions may use a .06MFD capacitor in this application.
Note 3. Not used in some versions.
Note 4. Some versions may use a .1MFD capacitor in this application.

CONTROLS

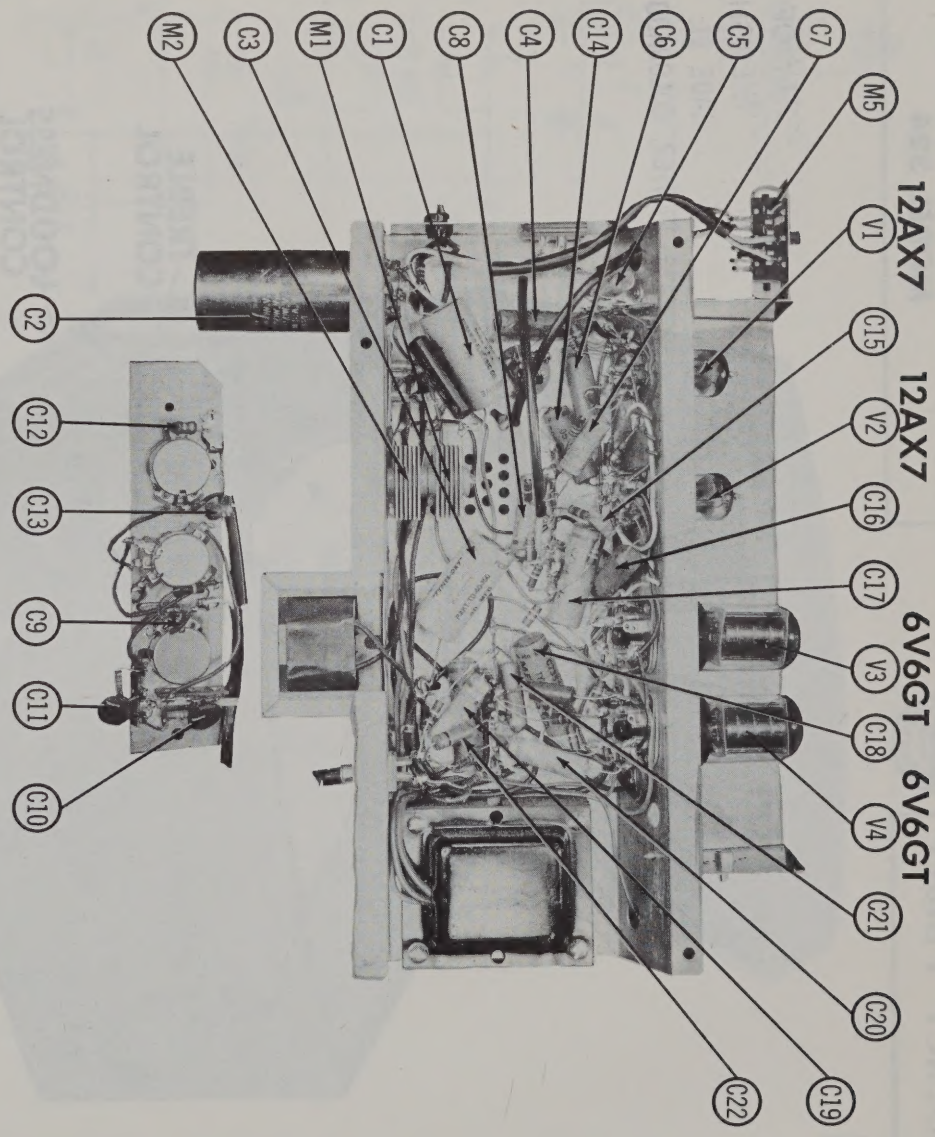
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Columbia Records PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	300KΩ	½	VC-71		A47F1-250K	ABT-53		Treble-tapped @ 150KΩ
B	Shaft		Not Req.		KSS-3	AK-4		Attach to R1A
R2	1Meg	½	VC-70				UDT-289	Loudness-tapped @ 300KΩ and 650KΩ
R3A	1Meg	½	VC-72	Q11-137	A47-1Meg-S	AB-69	U-54	Bass
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R3A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Columbia Records PART No.	IRC PART No.	
R4	10KΩ	½		BTS-10K	
R5	3.3Meg	½		BTS-3.3Meg	
R6	68KΩ	½		BTS-68K	
R7	270KΩ	½		BTS-270K	
R8	3.3Meg	½		BTS-3.3Meg	
R9	47KΩ	½		BTS-47K	
R10	68KΩ 5%	½		BTS-68K 5%	
R11	22KΩ	½		BTS-22K	Note 1
R12	22KΩ 5%	½		BTS-22K 5%	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Columbia Records PART No.	IRC PART No.	
R13	100KΩ	½		BTS-100K	
R14	33KΩ	½		BTS-33K	
R15	33KΩ	½		BTS-33K	
R16	10Meg	½		BTS-10Meg	
R17	100Ω 5%	½		BTS-100Ω 5%	
R18	270KΩ	½		BTS-270K	
R19	10Meg	½		BTS-10Meg	
R20	270KΩ	½		BTS-270K	
R21	270KΩ	½		BTS-270K	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Columbia Records PART No.	IRC PART No.	
R22	100KΩ	½		BTS-100K	
R23	150Ω	2			
R24	270KΩ	½		BTS-270K	
R25	470Ω 5%	½		BTS-470 5%	
R26	6.8Meg	½		BTS-6.8Meg	
R27	10KΩ	1		BTA-10K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Columbia Records PART No.	IRC PART No.	
R28	10KΩ	½		BTS-10K	Note 2
R29	6.8Meg	½		BTS-6.8Meg	
R30	68Ω	½		BTS-68	Note 2
R31	68KΩ	½		BTS-68K	
R32	22KΩ	½		BTS-22K	
R33	220Ω	2			

Note 1. Some versions use a 33KΩ resistor in this application.
Note 2. Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	Columbia Records PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @.1A	125VAC .090A	6.3VAC @1.5A		PT-1008					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Columbia Records PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	9.3KΩ	1.7Ω	TR-113	A-3830	A-3027	S-55X	Z1011	26S47	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Columbia Records PART No.	JENSEN PART No.	QUAM PART No.	
SP1	6"	PM	3.4Ω	SP-66 ①		6A21LF	①Speakers connected in parallel
SP2	6"	PM	3.4Ω	SP-66 ①		6A21LF	② Electrostatic speakers connected in parallel
SP3				SP-1 ②			
SP4				SP-1 ②			

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	Columbia Records PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.090ADC	SE-1001		RS-100	6S100	5M1	100	
M2	.090ADC	SE-1001		RS-100	6S100	5M1	100	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	Columbia Records PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M3						

PHONO NEEDLE

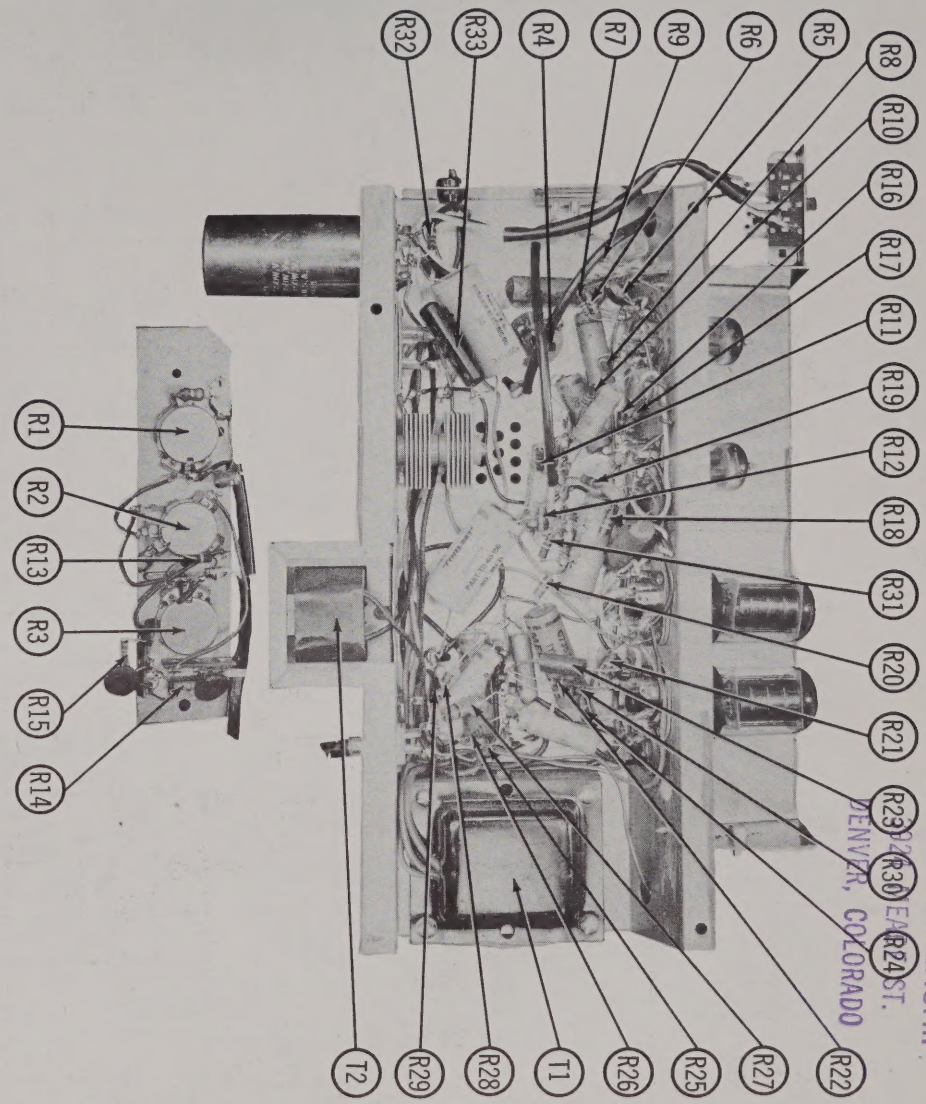
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	Columbia Records PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M4		†GE-11 or ♦†GE-11SD or ♦GE-11D	†AC-410 or ♦†AC-410D1 or †♦AC-410D2 or ♦AC-410D	†W-66TPS or ♦†W-66DS or ♦W-66TPD	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	Columbia Records PART No.	NOTES
M5	Switch		Tuner-Phone (4PDT-Slide type)

CHASSIS—BOTTOM VIEW



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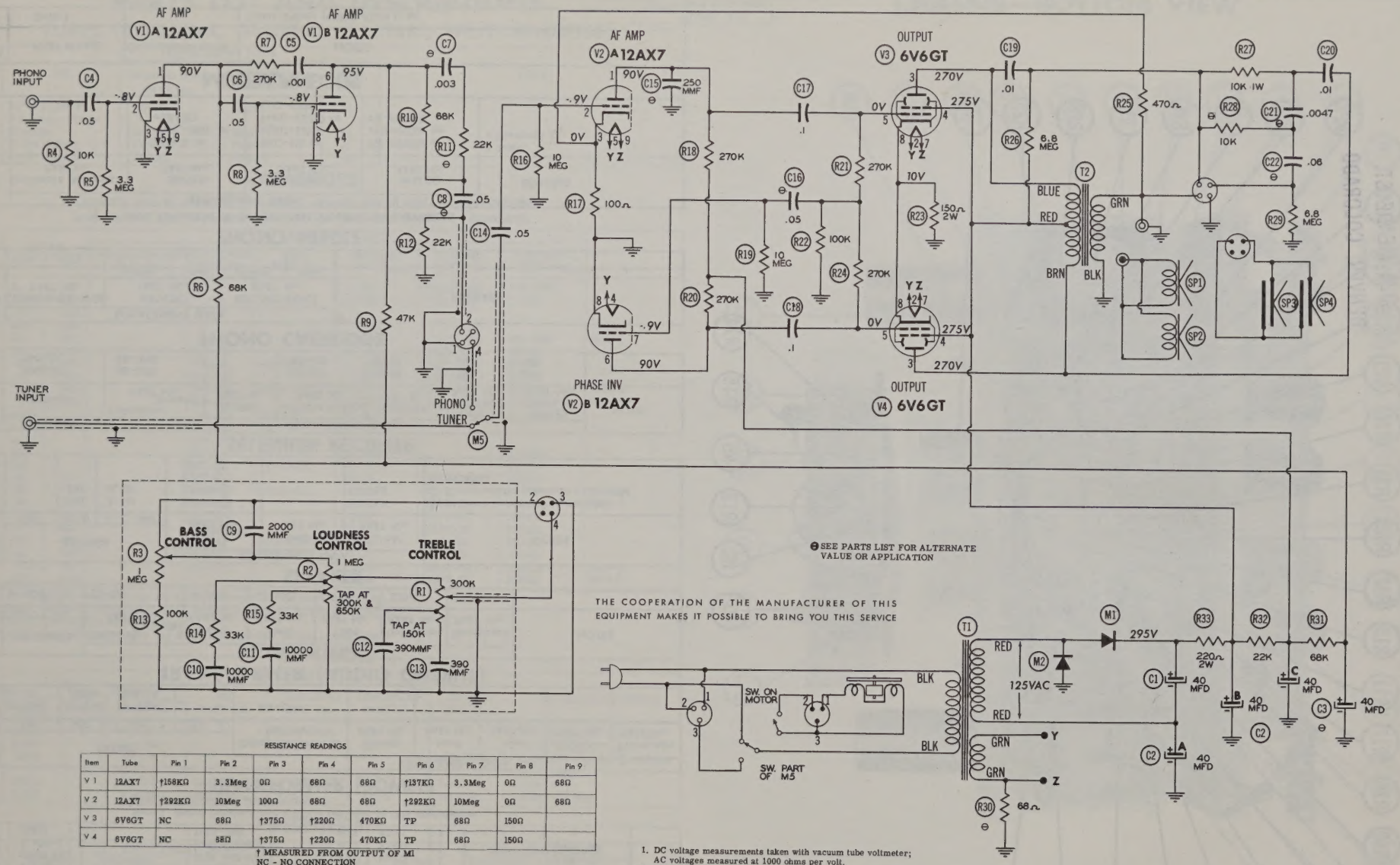

SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	†158KΩ	3.3Meg	0Ω	68Ω	68Ω	†137KΩ	3.3Meg	0Ω	68Ω
V 2	12AX7	†292KΩ	10Meg	100Ω	68Ω	68Ω	†292KΩ	10Meg	0Ω	68Ω
V 3	6V6GT	NC	68Ω	†375Ω	†220Ω	470KΩ	TP	68Ω	150Ω	
V 4	6V6GT	NC	68Ω	†375Ω	†220Ω	470KΩ	TP	68Ω	150Ω	

† MEASURED FROM OUTPUT OF M1
NC - NO CONNECTION
TP - TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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PHOTOFACT* Folder

RETMA MEMBER

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MODEL H-21TOBHa

CROSLEY MODELS H-17TOBHa, TOBHd, TOMHa, TOMHd, TOWHa, TOWHd, H-21COBHa, COBHd, COMHa, COMHd, COSBHa, COSBHd, COSHa, COSHd, COWHa, COWHd, HCBHa, HCBHd, HCMHa, HCMHd, HCWHa, HCWHd, HPBHa, HPBHd, HPWHa, HPWHd, TOBHa, TOBHd, TOMHa, TOMHd, TOWHa, TOWHd (Ch. 431-1, -3, 432-1, -3, 443, 443-3)

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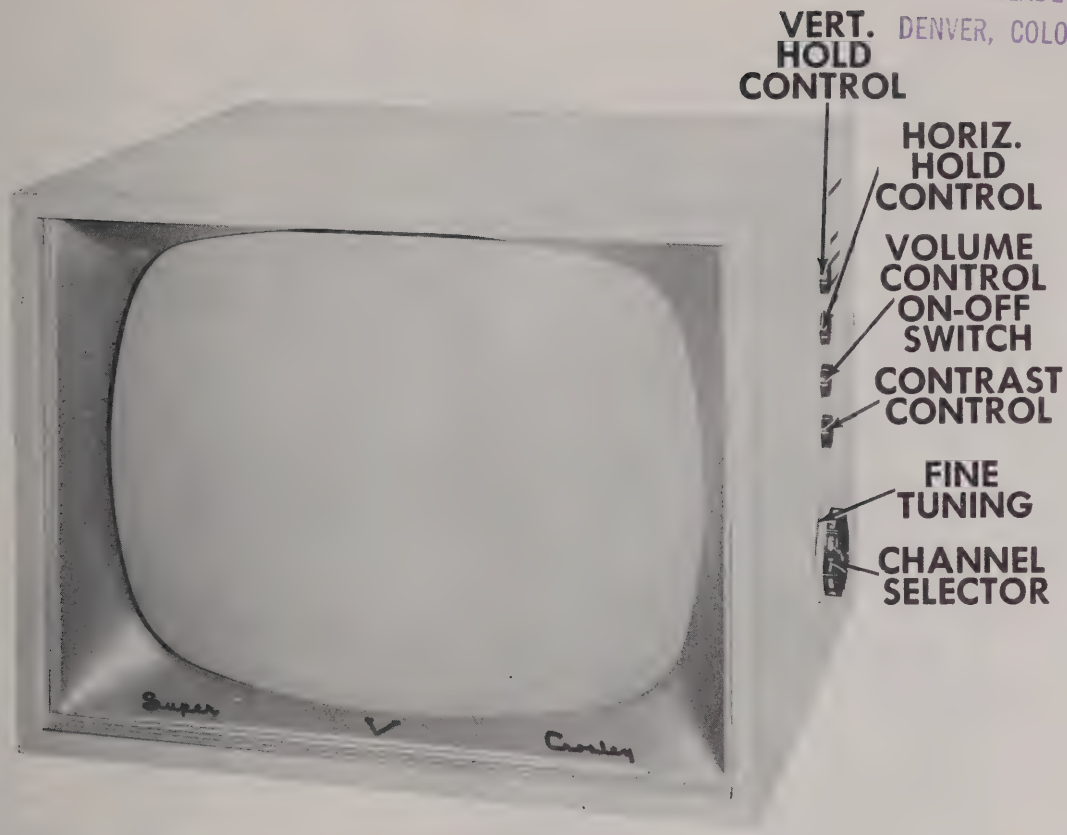

TRADE NAME	Crosley	MODEL	CHASSIS
		H-17TOBHa, H-17TOMHa, H-17TOWHa	432-1
		H-17TOBHd, H-17TOMHd, H-17TOWHd	432-3
		H-21COBHa, H-21COMHa, H-21COSBHa, H-21COSHa, H-21COWHa, H-21HCBHa, H-21HCMHa, H-21HCWHa, H-21TOBHa, H-21TOMHa, H-21TOWHa	431-1
		H-21COBHd, H-21COMHd, H-21COSBHd, H-21COSHd, H-21COWHd, H-21HCBHd, H-21HCMHd, H-21HCWHd, H-21TOBHd, H-21TOMHd, H-21TOWHd	431-3
		H-21HPBHa, H-21HPWHa	443
		H-21HPBHd, H-21HPWHd	443-3
MANUFACTURER	Crosley Corp., 1329 Arlington Street, Cincinnati, Ohio		
TYPE SET	Television Receiver		
TUBES	Sixteen		
POWER SUPPLY	110-120 Volts AC-60 Cycle	RATING 1.14 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13, Video IF 26.4, Sound IF 21.9MC (Intercarrier)		

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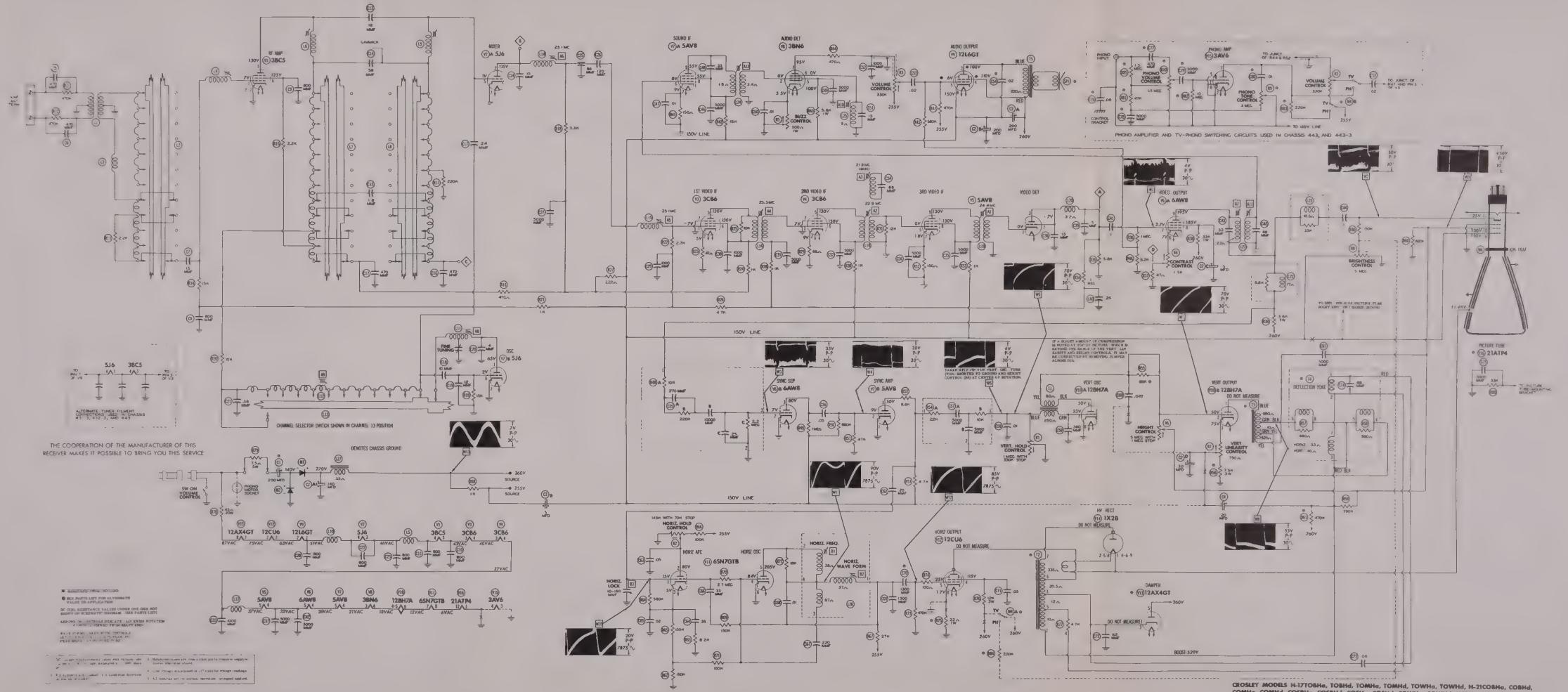
RF AMP V1 3BC5
MIXER V2 A 5J6
SOUND IF V7 A 5AV8
AUDIO DET V8 3BN6
AUDIO OUTPUT V9 12L6GT
PHONO AMP V15 3AV6
1ST VIDEO IF V3 3CB6
2ND VIDEO IF V4 3CB6
3RD VIDEO IF V5 5AV8
VIDEO DET
VIDEO OUTPUT V6 A 6AW8
SYNC SEP V16 A 6AW8
SYNC AMP V17 A 5AV8
VERT OSC V18 A 12BH7A
VERT OUTPUT V19 A 12BH7A
DO NOT MEASURE
HORIZ. LOCK
HORIZ HOLD CONTROL
HORIZ AFC
HORIZ OSC V11 6SN7GTB
HORIZ. FREQ.
HORIZ. WAVE FORM
HORIZ OUTPUT V12 12CU6
DO NOT MEASURE
HV RECT V14 1X2B
DO NOT MEASURE
DAMPER V13 12AX4GT
BOOST 520V
PICTURE TUBE V21 21ATP4
DEFLECTION YOKE
FOCUS
BRIGHTNESS CONTROL
CONTRAST CONTROL
VERT LINEARITY CONTROL
HEIGHT CONTROL
VOLUME CONTROL
BUZZ CONTROL
PHONO VOLUME CONTROL
PHONO TONE CONTROL
TV VOLUME CONTROL
FINE TUNING
OSC V17 B 5J6
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
150V LINE
260V SOURCE
255V SOURCE
SW ON VOLUME CONTROL
PHONO MOTOR SOCKET
DENOTES CHASSIS GROUND
12AX4GT 12CU6 12L6GT 5J6 3BC5 3CB6 3CB6
5AV8 5AV8 6AW8 5AV8 3BN6 12BH7A 6SN7GTB 21ATP4 3AV6
5J6 3BC5
ALTERNATE TUNER FILAMENT CONNECTIONS USED IN CHASSIS 431-1, 432-1, AND 443
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
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PHONO AMPLIFIER AND TV-PHONO SWITCHING CIRCUITS USED IN CHASSIS 443, AND 443-3

CROSLEY MODELS H-17TOBHa, TOBHd, TOMHa, TOMHd, TOWHa, TOWHd, H-21COBHa, COBHd, COMHa, COMHd, COSBHa, COSBHd, COSHa, COSHd, COWHa, COWHd, HCBHa, HCBHd, HCMHd, HCWHa, HCWHd, HPBHa, HPBHd, HPWHa, HPWHd, TOBHa, TOBHd, TOMHa, TOMHd, TOWHa, TOWHd (Ch. 431-1, -3, 432-1, -3, 443, 443-3)

CROSLEY MODELS H-17TOBHa, TOBHd, TOMHa, TOMHd, TOWHa, TOWHd, H-21COBHa, COBHd, COMHa, COMHd, COSBHa, COSBHd, COSHa, COSHd, COWHa, COWHd, HCBHa, HCBHd, HCMHd, HCWHa, HCWHd, HPBHa, HPBHd, HPWHa, HPWHd, TOBHa, TOBHd, TOMHa, TOMHd, TOWHa, TOWHd (Ch. 431-1, -3, 432-1, -3, 443, 443-3)

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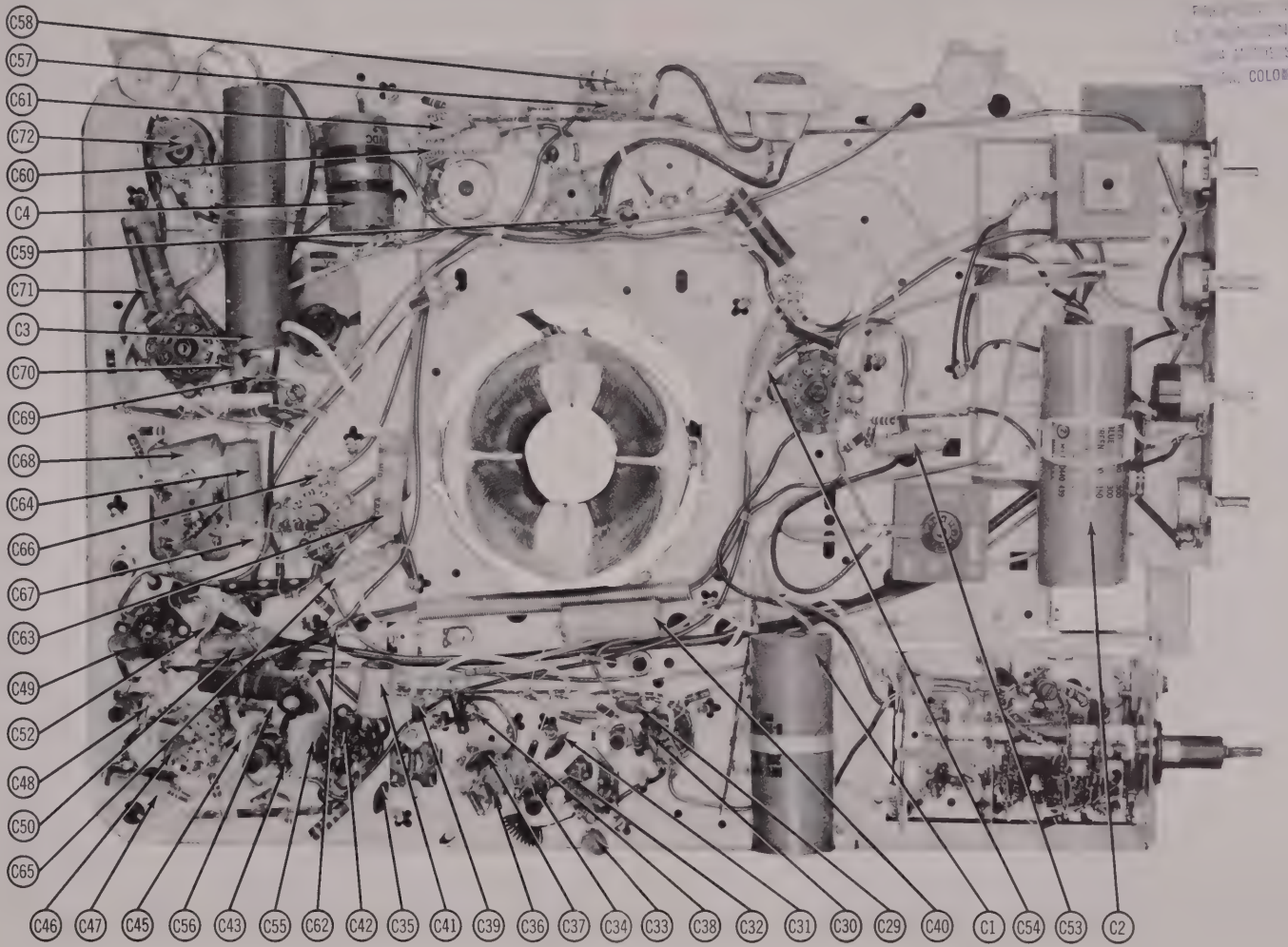
CHASSIS-TOP VIEW

CROSLEY MODELS H-17TOBHa, TOBHd, TOMHa, TOMHd, TOWHa, TOWHd, H-21COBHa, COBHd, COMHa, COMHd, COSBHa, COSBHd, COSHa, COSHd, COWHa, COWHd, HCBHa, HCBHd, HCMHa, HCMHd, HCWHa, HCWHd, HPBHa, HPBHd, HPWHa, HPWHd, TOBHa, TOBHd, TOMHa, TOMHd, TOWHa, TOWHd (Ch. 431-1, -3, 432-1, -3, 443, 443-3)



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

CROSLEY MODELS H-177OBHa, TOBHd, TOMHa, TOMHd, TOWHa, TOWHd, H-21COBHa, COBHd, COMHa, COMHd, COSHa, COSHd, COWHa, COWHd, HCBHa, HCBHd, HCMHa, HCMHd, HCWHa, HCWHd, HPBHa, HPBHd, HPWHa, HPWHd, TOBHa, TOBHd, TOMHa, TOMHd, TOWHa, TOWHd (Ch. 431-1, -3, 443-1, -3, 443-3)

TUBE PLACEMENT CHART

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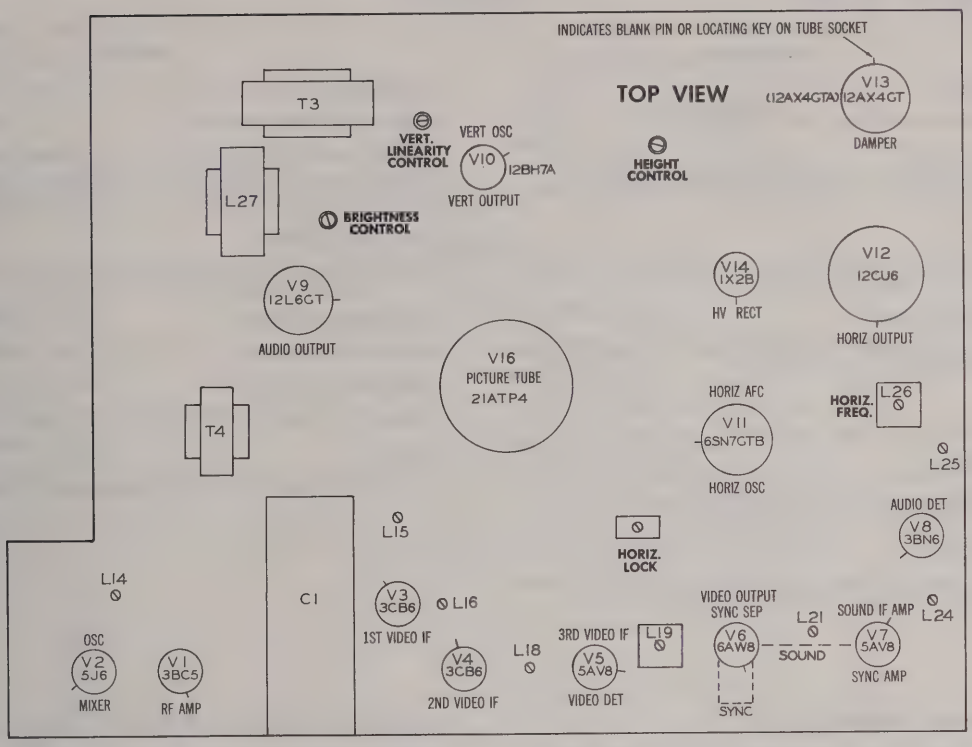


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

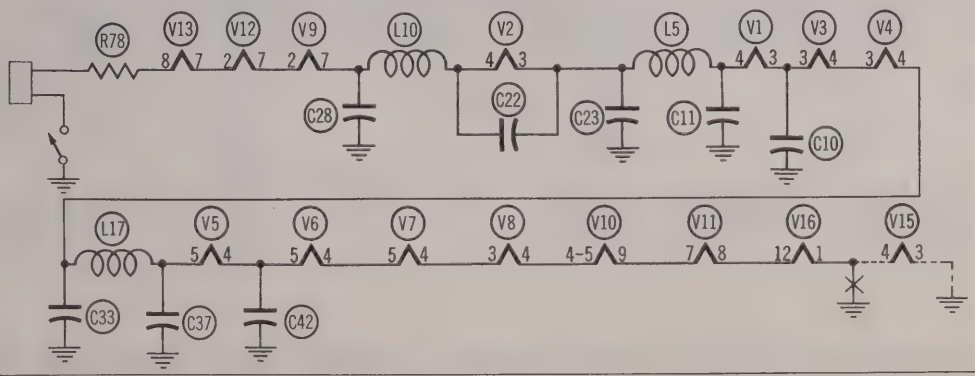
POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifiers (M1 & M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6, V9**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V16**
Has pic, no sound - **V7, V8, V9**
Overloaded picture -

SYNC FAILURE
No vert. sync - **V7, V10**
No horiz. sync - **V7, V11**
No vert. or horiz. sync - **V6, V7**

SWEEP FAILURE
No raster, has sound - **V11, V12, V13, V14, V16**
No vertical deflection - **V10**
Poor vert. linearity or foldover - **V10**
Poor horiz. linearity or foldover - **V11, V12, V13**
Narrow picture - **V11, V12, V13, V14, M1, M2**
Vert. off freq. -**V7, V10**
Horiz. off freq. - **V7, V11**

NOTE: Since this receiver employs tubes used in a series-parallel failment network, an open filament in any tube in series may cause the set to be inoperative. (See circuit below.)



SET 279 FOLDER 3

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V12 and V13. Check C70, C69, R76, T2, T4A and other associated components.

DRIVE LINES

Check by substitution V12 and V13. Check C70, C69, C66, R67, R76, T2, T4A and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V12 and V13. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V11, V12 and V13. Check C64, C65 and R63 for open. Check L26, R72, C67 and other associated components.

XMAS TREE EFFECT

Check by substitution V11, V12 and V13. Check T2 and T4 for internal arcing. Check C63, C68, C70, R66, R67, L26 and other associated components.

VERTICAL

LOSS OF SWEEP

Substitute V10. Check waveform W7.

If Satisfactory	If Unsatisfactory
Check T3, T4B, R59, R56, C4 and other associated components.	Check T1, C59, C60, R59, R6, R55 and other associated components.

INSUFFICIENT SWEEP

Substitute V10. Check height and vertical linearity controls for proper operation. Check R55, T3 and other associated components.

COMPRESSED AT BOTTOM

Substitute V10. Check R59, R55, R6, T1, C59 and other associated components.

COMPRESSED AT TOP

Substitute V10. Check R56, R7, C4, C2D, T3, T4B and other associated components.

FOLDS

Substitute V10. Check C60, T2, T3, R56 and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V6 and V7. Check C55A, C55B, C56, R50, R52, R49 and other associated components.

LOSS OF VERTICAL SYNC - HORIZONTAL SYNC SATISFACTORY

Substitute V10. Check vertical integrator network. Check T1, R1, C59 and other associated components.

LOSS OF HORIZONTAL SYNC - VERTICAL SYNC SATISFACTORY

Substitute V11. Check C62, C63, C67, R66, R2, R63 and other associated components.

HORIZONTAL BENDING

Check by substitution V6, V7 and V11. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Substitute V6. Check C41, C44, C2C, R38, R39 and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustment A7. Check video IF alignment.

POOR CONTRAST

Substitute V6. Check C41, C44, L22, L23, R37, R39 and other associated components.

NEGATIVE PICTURE

Substitute V6. Check picture tube. Check video detector network. Check C41, C44 and other associated components.

SMEAR

Substitute V6. Check L20, L22, L23, C41, C44 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V1, V3, V4, V5 and V6 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V7, V8 and V9. Check stage V9 using audio signal generator. Apply audio signal across R3.

If Satisfactory	If Unsatisfactory
Check audio detector and audio IF stages for component failure or change of value.	Check C52, C53, C54, R44, R45, R47, T5, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustments R5 and A10 for minimum buzz. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

POWER

DEAD SET

If filaments fail to light, check all tubes. These tubes are in series. Check switch on volume control. Check AC interlock assembly. If filaments light, check M1 and M2. Check R79 and C1. Check B+ filter and decoupling network.

SMALL AND/OR DIM PICTURE

Check M1, M2, R79 and C1. Check B+ filter and decoupling network.

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TROUBLE SHOOTING AIDS (cont)

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V11, V12, V13 and V14. Check waveform W12.

If Satisfactory	If Unsatisfactory
Check T2, T4A, C72, C71, C73, R76 and other associated components.	Check C63, C67, C68, C70, L26, R67, R66, R2 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V12 and V13. Check M1 and M2. Check R79, R76, C70, C68 and other associated components.

BLOOMING

Check by substitution V12, V13 and V14. Check M1 and M2. Check R79, R76, C70, C73 and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V1, V2, V3, V4, V5, V6 and V9. Check video IF components for failure or change of value.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

KEYSTONE EFFECT

Check T4 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.

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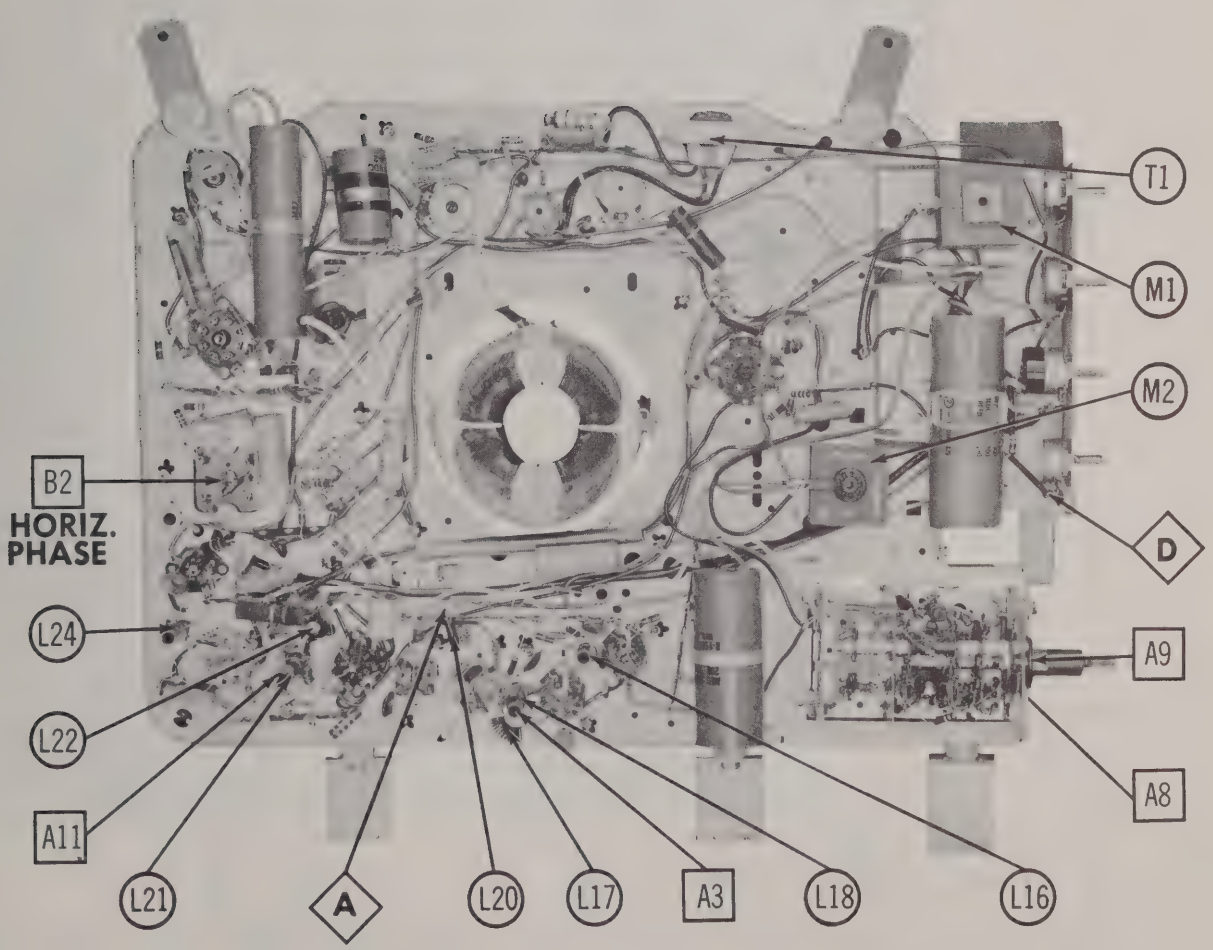
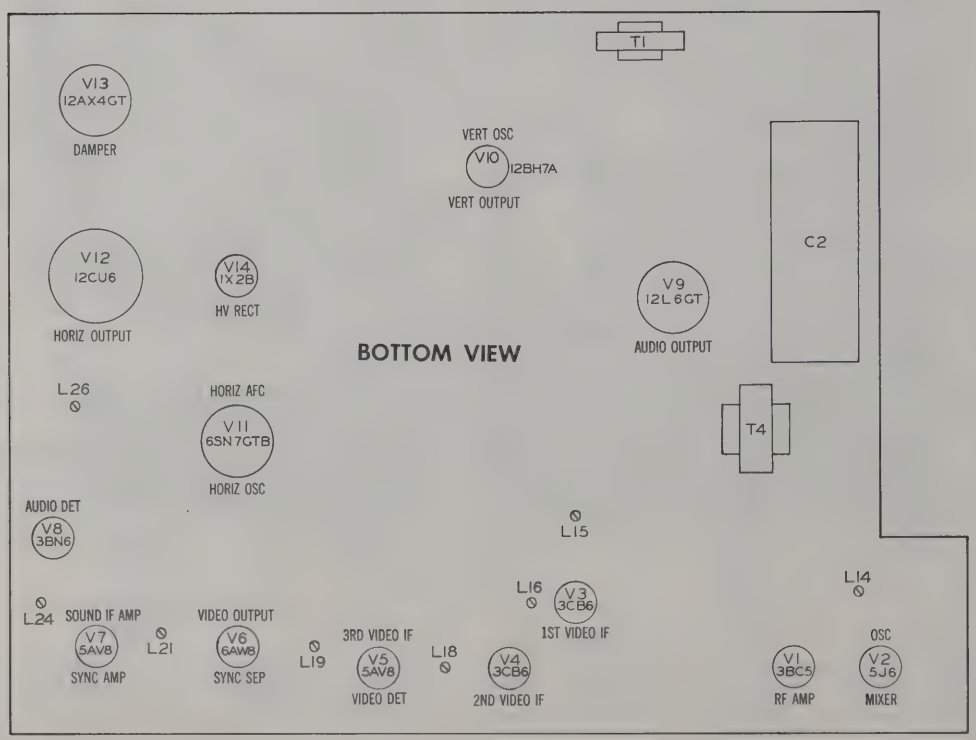


CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	3BC5	1Meg	0Ω	10Ω	11Ω	■700Ω	■3KΩ	0Ω		
V 2	5J6	■10. 5KΩ	■3. 3KΩ	11Ω	12Ω	220KΩ	15KΩ	0Ω		
V 3	3CB6	1Meg	47Ω	10Ω	9Ω	■1. 2KΩ	■1. 2KΩ	0Ω		
V 4	3CB6	1Meg	68Ω	9Ω	8Ω	■1KΩ	■1KΩ	0Ω		
V 5	5AV8	. 3Ω	5. 6KΩ	5. 6KΩ	7Ω	8Ω	. 2Ω	150Ω	■1KΩ	■1KΩ
V 6	6AW8	0Ω	2. 2Meg	■1Meg	6Ω	7Ω	450Ω	1Meg	†33KΩ	†5. 6KΩ
V 7	5AV8	0Ω	40KΩ	■4. 7KΩ	5Ω	6Ω	. 8Ω	150Ω	■18KΩ	■18KΩ
V 8	3BN6	300Ω	3. 4Ω	5Ω	4Ω	■5. 6KΩ	5Ω	†330KΩ		
V 9	12L6GT	NC	15Ω	†300Ω	†55Ω	230KΩ	TP	12Ω	200KΩ	
V 10	12BH7A	▲1KΩ	▲1. 4Meg	7. 5KΩ	4Ω	4Ω	▲1. 4Meg	400KΩ	0Ω	3Ω
V 11	6SN7GTB	650KΩ	†60KΩ	300KΩ	250KΩ	†25KΩ	0Ω	3Ω	2Ω	
V 12	12CU6	NC	19Ω	TP	†12KΩ	470KΩ	TP	15Ω	22Ω	Top Cap ▲20Ω
V 13	12AX4GT	NC	NC	300KΩ	NC	†55Ω	TP	19Ω	21Ω	
V 14	1X2B		PINS	1 - 8	HAVE	INFINITE	RESISTANCE			Top Cap ▲355Ω
V 15	3AV6	■10Meg	■0Ω			■0Ω	■0Ω	†220KΩ		
V 16	21ATP4	0Ω	0Ω	Pin 6 ■0Ω	Pin 10 ▲320KΩ	Pin 11 ■200KΩ	Pin 12 2Ω			

■ MEASURED FROM 150V LINE
† MEASURED FROM OUTPUT OF M1.
▲ MEASURED FROM PIN 3 OF V13.
† MEASURED WITH TELEVISION-PHONO SWITCH IN PHONO POSITION
NC - NO CONNECTION
TP - TIE POINT



TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
Note: One side of the chassis is connected to the power line.
The high voltage lead should be taped and kept away from the chassis. Keep output low from sweep and signal generator and keep contrast control (R4) low enough to prevent overloading of circuits.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery to the tuner AGC (white) lead. Positive lead to chassis.
Remove the converter tube (V2) from its socket and replace with a 5J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Attenuate generator output to maintain approximately -2 volts on VTVM unless another value is specified.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to point (B). Low side to chassis.	24.4MC (Unmod)	Any	DC probe to point (A). Common to chassis.	A1	Adjust for maximum deflection. Attenuate generator for reading of -1 volt on VTVM at peak reading.
2.	"	"	22.9MC	"	"	A2	Adjust for maximum deflection. If two peaks occur, use the peak nearest the clip end of the coil.
3.	"	"	21.9MC	"	"	A3	Adjust for MINIMUM deflection. Use enough generator output to produce .5 volts deflection at minimum reading. Use the null obtained with the core nearest the clip end of the coil. Repeat steps 2 and 3.
4.	"	"	25.5MC	"	"	A4	Adjust for maximum deflection.
5.	"	"	25.1MC	"	"	A5	Adjust for maximum deflection. Use peak nearest clip end of coil.
6.	"	High side to point (C). Low side to chassis.	"	"	"	A6	Shunt L15 with 100Ω resistor in series with .001MFD capacitor. Adjust A6 for maximum deflection.

OVERALL VIDEO IF RESPONSE CHECK

Leave bias connected as under "Video IF Alignment". Use only enough sweep generator and marker output to provide usable indication on scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Set the contrast control for minimum contrast.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.9MC 22.9MC 25.1MC 25.5MC 26.4MC	Any	Vert. amp. thru 10KΩ to point (D). Low side to chassis.		Check for response similar to Fig. 1. SLIGHTLY retouch A1 thru A6 to obtain desired response. If desired response cannot be obtained with slight retouching of A1 thru A6, steps 1 thru 6 should be repeated. Replace original 5J6 in its socket.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.01MFD	High side to pin 7 (grid) of 6AW8 (V6A). Low side to chassis.	4.5MC (400∿ Mod) (50KC Swp)	4.5MC	Any non-interfering channel.	Vert. amp. thru detector (Fig. 2) to pin 11 of picture tube. Low side to chassis.	A7	Adjust for MINIMUM 400∿ indication on scope.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 5J6 in its socket.
Allow the receiver to warm up for approximately five minutes.
Set the station selector switch to highest channel available in that area. Adjust contrast and volume control for normal reception.
Set the fine tuning control at the center of its range. With a non-metallic alignment tool, adjust the slotted head brass screw (A8) located at upper right of the tuning shaft for clearest and sharpest detail in the picture.
Check any other channels, 7 - 13, receivable in that area and make slight compromise adjustment of A8 if necessary for best reception of all high band channels. For low band channels set station selector switch to channel nearest channel 6 and adjust the slotted brass screw (A9) just below the tuning shaft for clearest and sharpest detail in the picture.

RF ALIGNMENT

The RF portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

SOUND IF ALIGNMENT USING ON THE AIR SIGNAL

Turn the set on and tune in a strong TV signal. Turn the buzz control (R5) 90° from maximum clockwise rotation. Adjust A10 for maximum volume. Reduce the signal strength. (Remove the antenna from antenna terminals and stray feed the signal by placing antenna near antenna terminals.) Adjust A11 and A12 for maximum volume. Adjust R5 for minimum noise. Reconnect antenna and readjust A10 for maximum volume. If necessary, reduce volume so this peak can be heard.

ALTERNATE SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR, AM SIGNAL GENERATOR AND OSCILLOSCOPE

Connect the synchronzied sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Set the volume control at a low volume level.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.01MFD	High side to pin 7 (grid) of 6AW8 (V6A). Low side to chassis.	4.5MC (400∿ Mod) (50KC Swp)	4.5MC	Any non-interfering channel.	Across secondary of T5.	A10	Set buzz control (R5) 90° from maximum clockwise rotation. Adjust A10 for maximum 400∿ indication on scope.
10.	"	"	"	"	"	"	A12, A11	Attenuate generator output so that signal is below the limiting level of the 3BN6 as evidenced by background hiss and noise. Adjust A12 and A11 for maximum 400∿ indication on scope.
11.	"	"	Not used.	4.5MC (400∿ Mod)	"	"	R5	Use a high generator output and adjust R5 for MINIMUM 400∿ indication on scope.
12.	"	"	4.5MC (400∿ Mod) (50KC Swp)	4.5MC	"	"	A10	With volume control at low level retouch A10 for maximum 400∿ indication on scope.

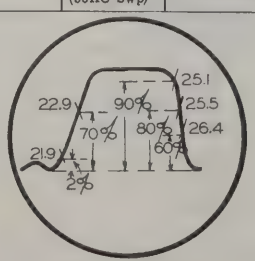


FIG. 1

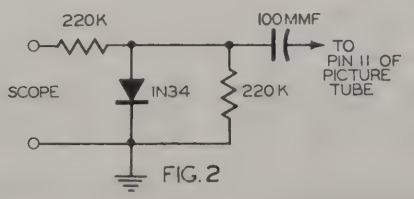


FIG. 2

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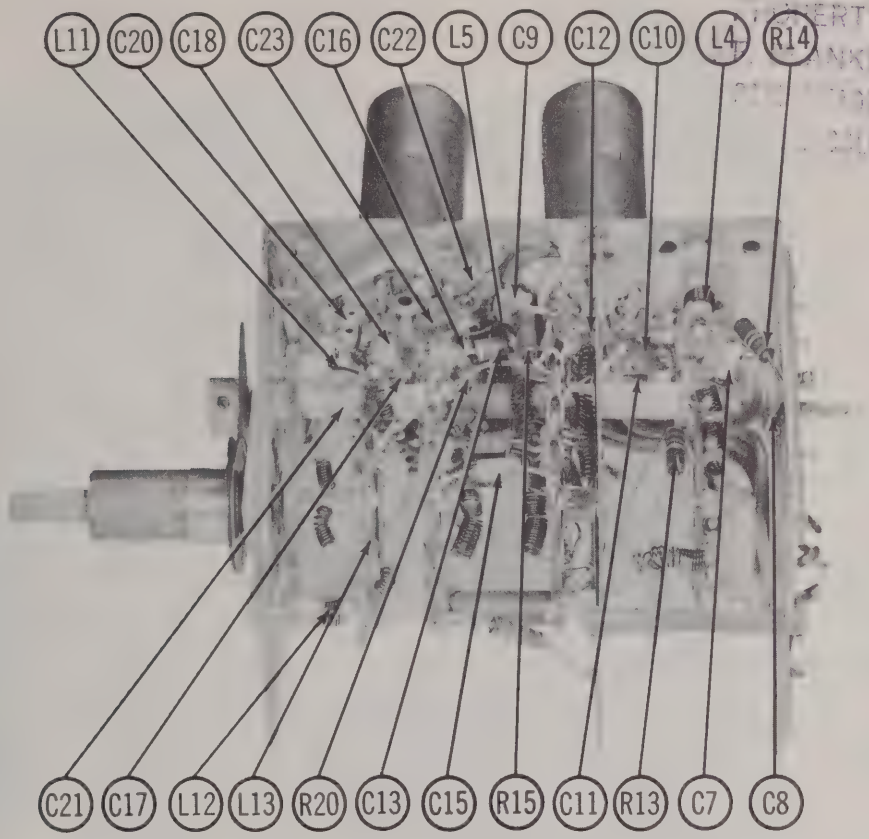
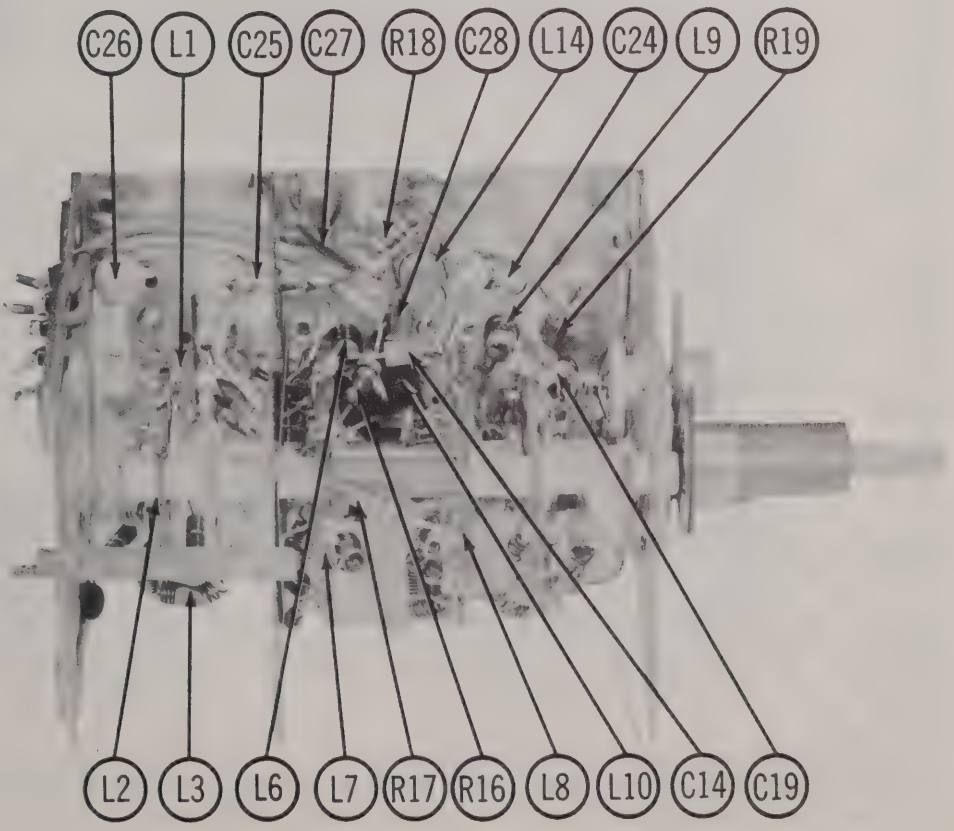
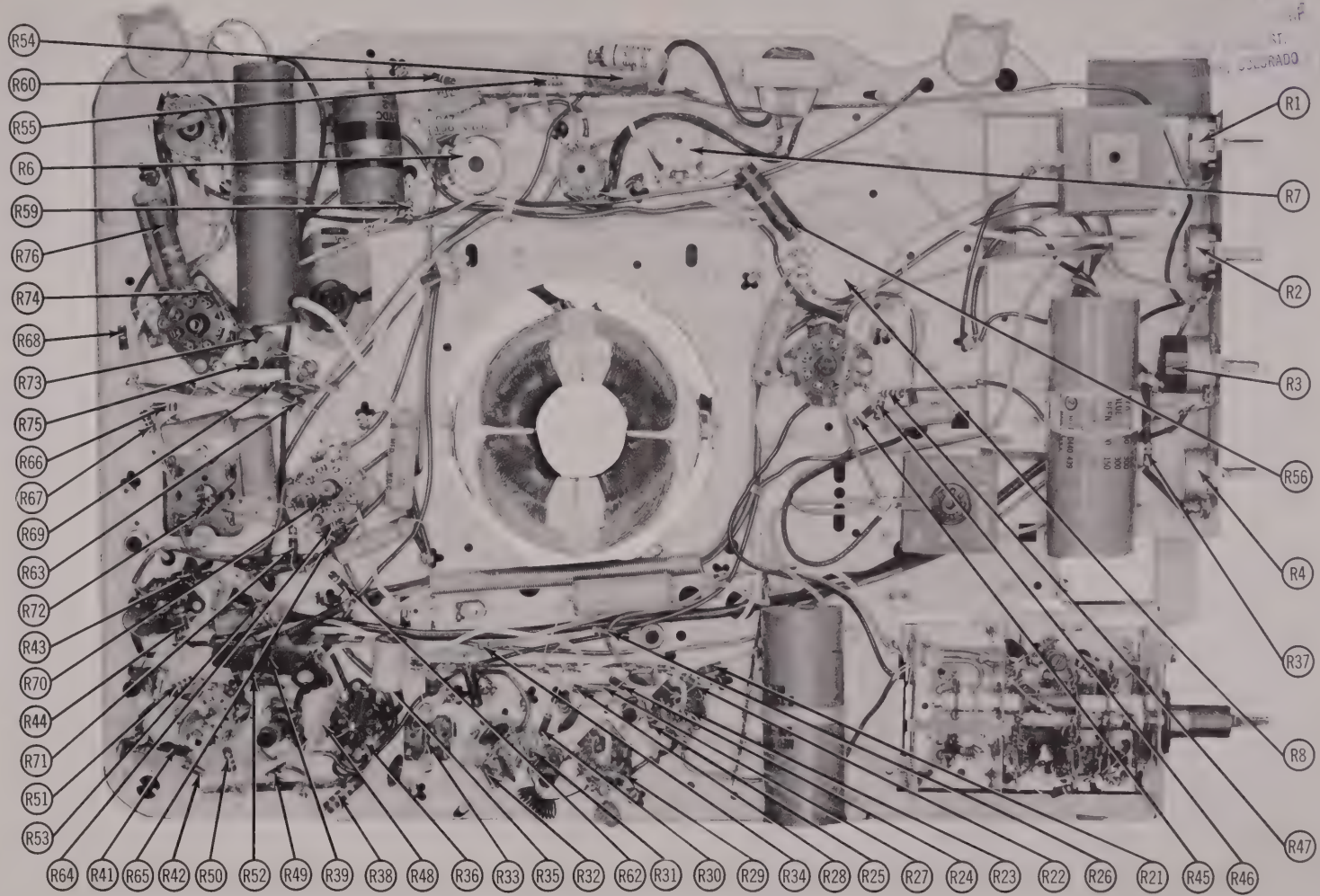


RF TUNER-RIGHT SIDE

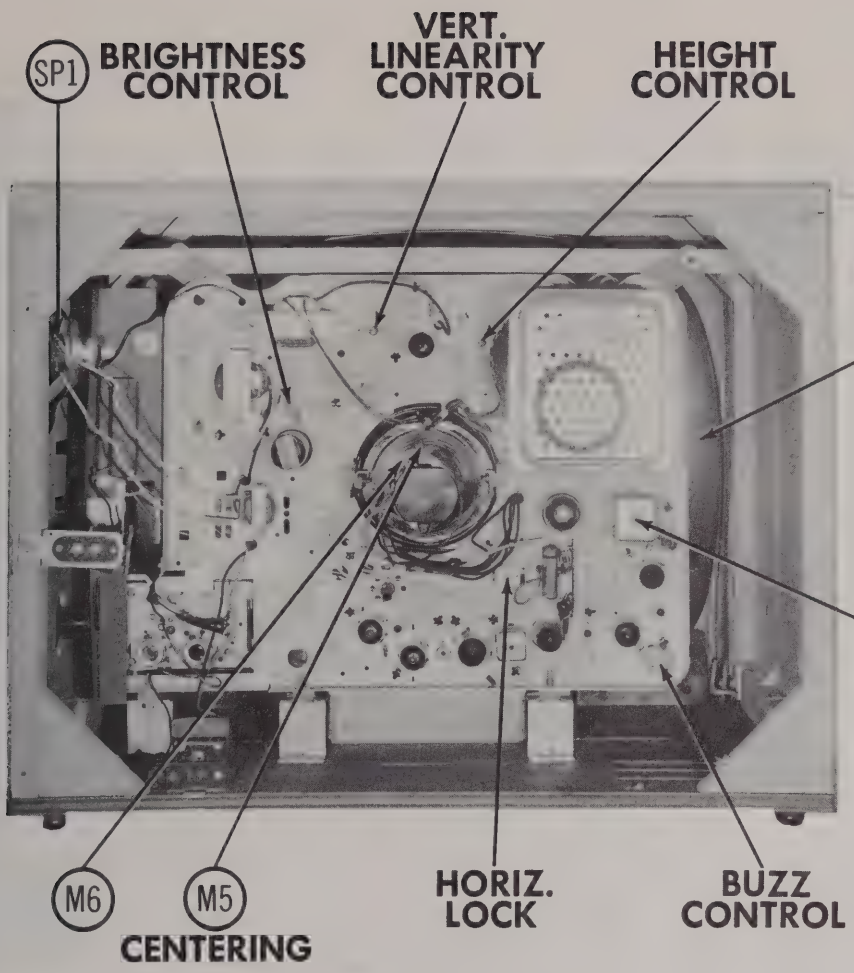


RF TUNER-LEFT SIDE



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

CROSLEY MODELS: H-177OBHe, TOBHd, TOMHe, TOMHd, TOWHe, TOWHd, H-21COBHe, COBHd, COMHe, COMHd, COSHe, COSHd, COWHe, COWHd, HCBHe, HCBHd, HCMHe, HCMHd, HCWHe, HCWHd, HPBHe, HPBHd, HPWHe, HPWHd, TOBHe, TOBHd, TOMHe, TOMHd, TOWHe, TOWHd (Sr. 431-1, -2, 432-1, -2, 443, 443-2)



PROPERTY OF
L. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern. Set contrast control for normal contrast.

1. Set the horizontal hold control to its mid-range position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

2. Connect the vertical amplifier of an oscilloscope thru 10MMF to lug 4 of L26. Connect the low side to chassis. Adjust the horizontal waveform slug (B2) until waveform similar to Fig. 3 is obtained. While making this adjustment keep the picture in sync with the horizontal hold and if necessary, B1 and the horizontal lock trimmer (B3).

3. Turn the horizontal hold control fully clockwise. Turn B1 counter clockwise until the picture just loses sync, then turn B1 clockwise until picture is just ready to pull in sync.

4. Turn the horizontal hold control fully counter clockwise. Picture should remain in sync. Momentarily remove the signal by switching off channel and back again. If more than seven bars are present, adjust the horizontal lock trimmer (B3) slightly counter clockwise until 3 or 4 bars appear when switching off channel and back again. If less than 3 bars are present when switching off channel and back again, adjust B3 slightly clockwise and check by switching off channel and back again.

Repeat steps 3 and 4 until the effective pull in range of the horizontal hold control is from 60 to 120 degrees.

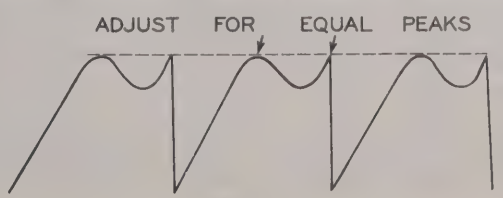


FIG. 3

PROPERTY OF
ANKENSHIP

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: CROSLEY PART No.	STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	3BC5	3BC5	7BD	
V2	Osc.-Mixer	5J6	5J6	7BF	
V3	1st Video IF Amp.	3CB6	3CB6	7CM	
V4	2nd Video IF Amp.	3CB6	3CB6	7CM	
V5	3rd Video IF Amp. Video Detector	6AV8	6AV8	9DZ	
V6	Video Output- Sync Separator	6AW8	6AW8	9DX	
V7	Sound IF Amp.- Sync Amp.	5AV8	5AV8	9DZ	
V8	Audio Detector	3BN6	3BN6	7DF	
V9	Audio Output	12L6GT	12L6GT	7S	
V10	Vert. Osc.- Vert. Output	12BH7A	12BH7A	9A	
V11	Horiz. AFC- Horiz. Osc.	6SN7GTB	6SN7GTB	6BD	
V12	Horiz. Output	12CU6	12CU6	6AM	
V13	Damper	12AX4GT	12AX4GT	6CG	12AX4GTA used as an alternate
V14	HV Rectifier	1X2B	1X2B	9Y	
V15	Photo Amp.	5AV8	5AV8	7BT	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: CROSLEY PART No.	CBS HYTRON PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V16	21ATP4 ① 21AUP4A	21ATP4 ①	21ATP4 L	21ATP4 ①	21ATP4 ①	12L 12L	① Aluminized

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: CROSLEY PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	NOTES
C1	300	300	158557-1				CD5b-200-300	D-100	Note 1
C2A	140	300	157835-3		FP419.4	TM-4007	TC-4007	Q-183	
B	200	150			TC78	TD-40-350°			
C	8	300							
D	30	150							
C3A	200	150	157836-1		FP218.1	TM-300-150	TD-R-150	D-088	
B	8	350				TD-R-160			
C4	30	450	157903-1			TC78	TD-30-450°	FM-4530	
C5	470	1000	157469-33	DD30-471	IR5KV-471	MCL347		K-3347	
C6	470	1000	137499-35	DD30-471	IR5KV-471	MCL347		K-3347	
C7	18			D6-150	GP1K-150	UC-5415			
C8	800			DD-801	801-001	DC-521			
C9	800			DD-801	801-001	DC-521			
C10	800			DD-801	801-001	DC-521			
C11	800			DD-801	801-001	DC-521			
C12	470			D6-471	GP2K-471	UC-5347			
C13	.18								
C14	.56								
C15	1.8								
C16	470								
C17	.24								
C18	10			TCN-10	NT50K-100	NT-541			
C19	13			TCS-13	NP0K-130	XT-5412			
C20	4				N330K-040				
C21	.56								
C22	800			DD-801	801-001	DC-521			
C23	800			DD-801	801-001	DC-521			
C24	15			TCS-15	NP0K-150	XT-5415			
C25	68								
C26	130			D6-131	811-121	UC-5312			
C27	5000			DD-502	811-005	DC-525			
C28	5000			DD-502	811-005	DC-525			
C29	1000		144678-14	DD-103	801-001	DC-521		K-1310	
C30	1000		144678-14	DD-103	801-001	DC-521		K-1310	
C31	5000		144678-2	DD-502	811-005	DC-525		C-1250	
C32	5000		144678-2	DD-502	811-005	DC-525		C-1250	
C33	1000		144678-14	DD-103	801-001	DC-521		K-1310	
C34	68	500	137499-33	TCZ-68	NP0L-680	ZT-5468		ER-1468	
C35	5000		144678-2	DD-502	811-005	DC-525		C-1250	
C36	5000		144678-2	DD-502	811-005	DC-525		C-1250	
C37	5000		144678-2	DD-502	811-005	DC-525		C-1250	
C38	15		137727-43		N1K02K-150				
C39	5		137727-103	D6-050	GP1K-050	UC-555			
C40	.25	100	157910-1			PT4025	DMP2-P25	3302025	
C41	.1	150	157909-1	DF-104		PT4010	DMP2-P1	3302010	
C42	5000		144678-2	DD-502	811-005	DC-525		C-1250	
C43	33		137727-126		N3S0L-330				
C44	.1	400		DF-104		PT401	DMP4-P1	330401	
C45	68		137727-133		N2S0M-680				
C46	5000		144678-2	DD-502	811-005	DC-525		C-1250	
C47	.01	200	39001-13	D6-103	GP2-333-103	PT411	DMP4-S1	330411	
C48	33		137727-126		N3S0L-330				
C49	5000		144678-2	DD-502	811-005	DC-525		C-1250	
C50	.01	200	39001-13	D6-103	GP2-333-103	PT411	DMP4-S1	330411	
C51	15		137727-43		N1K02K-150				
C52	1000		158215-17	DD-103	801-001	DC-521		K-1310	
C53	.02	200	39001-80	DF-203	821-03	PT413	DMP4-S2	330413	
C54	.02	200	39001-80	DF-203	821-03	PT413	DMP4-S2	330413	Note 2
C55A	270				GP2K-371	UC-5537			
B	10000		‡157813-1	‡PC-262	821-01	DC-511			
C	25				GP1K-250	UC-5425			
C56	.05	200	39001-17	DF-503	821-05	PT415	DMP2-S5	330215	
C57A	5000		‡157812-1	‡PC-106	811-006	DC-525		K-1250	
B	5000				811-005	DC-525		K-1250	
C58	.01	400	39478-41	D6-103	GP2-333-103	PT411	DMP4-S1	330411	
C59	560		144678-32	D6-561	811-561	UC-5356		K-1356	
C60	.047	400	39477-45	DF-503		PT4167	DMP4-S47	3304167	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: CROSLEY PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	NOTES
C61	5000		158215-26	DD-502	811-005	DC-525	IMP6-D5	C-1250	
C62	20		137727-61	D6-200	GP1K-300	UC-542		K-1420	
C63	.03	400	39001-37	DF-303		PT415	IMP4-S5	330415	
C64	.25	100	157910-1			PT4025	IMP2-P25	3302025	
C65	.02	200	39001-80	DF-203	817-03	PT413	IMP4-S2	330412	
C66	33		137727-126		N0S01-330				
C67	220	500	137498-23	TCZ-220	N2K-220			ER-1322	
C68	.01	400	149913-2						
C69	1300		144675-33						
C70	1300		144675-23						Note 3
C71	.05	400	39001-17	DF-503		PT415	IMP4-S5	330415	
C72	82	3000	158215-32	DD30-820					
C73	68	200	39001-55						Note 4
C74	68	3000	158215-8						
C75	5000			DD30-680	SKV-560				
C76	.05	400	39001-55	DD-502	811-005	DC-525		C-1250	
C77	470		137727-137	D6-471	GP2K-471	UC-5347		K-1347	Note 4
C78	1000		137727-141	DD-502	811-001	DC-525		C-1250	Note 4
C79	5000		137727-141	DD-502	811-005	DC-525		C-1250	Note 4
C80	.01	800	39378-61	D6-103	GP2-333-103	PT411	IMP6-S1	330611	Note 4

Note 1. Early production chassis 431-1 use 1404MFD @ 300V (part 4157837-1) in this application. Either the 1404MFD or 3004FD unit may be used for replacement.
Note 2. Chassis 443 and 443-3 use .0068MFD in this application (part #39378-40).
Note 3. Chassis 431-1 (Code 2), 443 and 443-3 use 980MMF in this application (part #144675-32).
Note 4. Used only in chassis 443 and 443-3.
† Items C58A, C58B, C58C, R48A, R49B and R48C are combined in one unit.
* Items C57A, C57B, R54A and R54B are combined in one unit.

CONTROLS

ITEM No	RATING: RESIST ANCE	WATTS	REPLACEMENT DATA: CROSLEY PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg with 330KΩ atop	½	B157805-1-3	Q11-135	A47-750-S	B-59	U-54	Vert. Hold - Note 1
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
R2A	145KΩ with 70KΩ atop	½	B157801-1-3	Q11-135	A47-75K-S	B-36	U-41	Horiz. Hold - Note 2
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3A	2330KΩ	½	B157803-1-2	Q13-132	A47-500K-Z	B-80-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A
C	Switch		Not Req.	7S-1	SWE-12	Not Req.	U8-16	Attach to R3A
R4A	1500Ω	½	B157804-1-2	Q17-109	A47-1500-S	AB-315	U-9	Contrast
B	Shaft		Not Req.	Not Req.	FS-3	AE-3	Not Req.	Attach to R4A
R5	500Ω	1	B157955-3-1		S5-500			Horiz (Wire wound)
R6A	5 Meg with 1Meg atop		B157806-1-1	Q11-141	A47-5Meg-S	AB-86	SU-67	Height - Note 3
B	Shaft		Not Req.	SQ	FS2-1/4	AE-1	Not Req.	Attach to R6A
R7A	750Ω	½	B157800-1-1	SQ-105	A47-750-S	AB-5	U-4	Vert. Linearity
B	Shaft		Not Req.	SQ	FS-3	AE-1	Not Req.	Attach to R7A
R8A	5Meg	½	B157802-1-3	Q17-141				Brightness
B	Shaft		Not Req.	SQ				Attach to R8A
R9	3Meg	½	158783-1					Phono Tone - Note 4
R10	1.5Meg	½	158781-1					Phono Volume - Note 4

Note 1: Connect a 330KΩ resistor in series with the left hand terminal of the control and the lead connecting to the original terminal. (Control viewed from shaft end, terminals down.)
Note 2: Connect a 68KΩ resistor in series with the right hand terminal of the control and the lead connecting to the original terminal. (Control viewed from shaft end, terminals down.)
Note 3: Connect a 1Meg resistor in series with the right hand terminal of the control and the lead connecting to the original terminal. (Control viewed from shaft end, terminals down.)
Note 4: Used in chassis 443 and 443-3 only.

RESISTORS

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: CROSLEY PART No.	IRC PART No.	NOTES
R11	470KΩ	½	39374-87	BTS-470K	
R12	470KΩ	½	39374-87	BTS-470K	
R13	2200Ω	½		BTS-220Ω	
R14	15KΩ	½		BTS-15K	
R15	2200Ω	½		BTS-220Ω	
R16	470Ω	½		BTS-470	
R17	220KΩ	½		BTS-220K	
R18	330Ω	½		BTS-330Ω	
R19	15KΩ	½		BTS-15K	
R20	10KΩ	½		BTS-10K	
R21	1000Ω	½	39374-25	BTS-1000	
R22	2700Ω	½	39374-30	BTS-2700	
R23	47Ω	½	39374-9	BTS-47	
R24	1000Ω	½	39374-25	BTS-1000	
R25	10KΩ	½	39374-37	BTS-10K	
R26	4700Ω	½	39374-33	BTS-4700	
R27	220Ω	½	39374-17	BTS-220	
R28	1000Ω	½	39374-25	BTS-1000	
R29	68Ω	½	39374-13	BTS-68	
R30	1000Ω	½	39374-25	BTS-1000	
R31	12KΩ	½	39374-36	BTS-12K	
R32	150Ω	½	39374-15	BTS-150	
R33	1000Ω	½	39374-25	BTS-1000	
R34	1Meg	½	39374-61	BTS-1Meg	
R35	5600Ω	½	39374-34	BTS-5600	
R36	1Meg	½	39374-61	BTS-1Meg	
R37	47Ω	½	39374-9	BTS-47	
R38	33KΩ	1	39374-43	BTA-33K	
R39	5600Ω	3	156361-3		
R40	100KΩ	½	39374-49	BTS-100K	
R41	150Ω	½	39374-15	BTS-150	
R42	18KΩ	½	39374-40	BTS-18K	

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: CROSLEY PART No.	IRC PART No.	NOTES
R43	5600Ω	½	39374-122	BTA-5600	
R44	470Ω	½	39374-21	BTS-470	
R45	5600Ω	½	39374-50	BTS-5600K	
R46	8200Ω	½	39374-36	BTS-8200	
R47	470KΩ	½	39374-57	BTS-470K	
R48A	120KΩ	1		BTS-470	
B	220KΩ	½	‡157813-1	BTS-220K	
C	2.2Meg	½		BTS-2.2Meg	
R49	1Meg	½	39374-61	BTS-1Meg	
R50	680KΩ	½	39374-59	BTS-680K	
R51	47KΩ	½	39374-45	BTS-47K	
R52	6800Ω	½	39374-35	BTS-6800	
R53	4700Ω	½	39374-33	BTS-4700	
R54A	22KΩ	½		BTS-22K	
B	10KΩ	½	‡157813-1	BTS-10K	
R55	68KΩ	½	39374-47	BTS-68K	Note 1
R56	7500Ω	½	156921-4		Note 2
R57	680Ω	½	39374-23	BTS-680	
R58	680Ω	½	39374-23	BTS-680	
R59	390KΩ	½	39374-56	BTS-390K	
R60	620KΩ	½	39374-58	BTS-620K	
R61	470KΩ	½	39374-57	BTS-470K	Note 3
R62	150KΩ	½	39374-51	BTS-150K	
R63	8200Ω	½	39374-36	BTS-8200	
R64	560KΩ	½	39374-52	BTS-560K	
R65	150KΩ	½	39374-51	BTS-150K	
R66	100KΩ	½	39374-49	BTS-100K	
R67	27KΩ	½	39374-43	BTS-27K	
R68	1000Ω	½	39374-25	BTS-1000	
R69	150KΩ	½	39374-51	BTS-150K	
R70	2.7Meg	½	39374-71	BTS-2.7Meg	
R71	100KΩ	½	39374-49	BTS-100K	

RESISTORS (cont)

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: CROSLEY PART No.	IRC PART No.	NOTES
R72	18KΩ	½	39374-40	BTS-18K	
R73	470KΩ	½	39374-57	BTS-470K	
R74	100Ω	½	39374-13	BTS-100K	
R75	22Ω	1	39374-93	BTA-23	Note 4
R76	12KΩ	3			
R77	47000Ω	½	39374-33	BTS-4700	
R78	45Ω	20	156230-3		

† Items R48A, R49B, R48C, C58A, C58B and C58C are combined in one unit.
* Items R54A, R54B, C57A and C57B are combined in one unit.
Note 1: Not used in some versions.
Note 2: Chassis 432-1 will use a 6300Ω resistor in this application.
Note 3: Used only in chassis 431-1, code C.
Note 4: Not used in chassis 431-1, Code D.
Note 5: Used only in chassis 443 and 443-3.

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: CROSLEY PART No.	IRC PART No.	NOTES
R79	7.5Ω	½	154089-1		
R80	33KΩ	½		BTS-33K	
R81	47KΩ	½		BTS-47K	Note 5
R82	10Meg	½		BTS-.0Meg	Note 5
R83	220KΩ	½		BTS-220K	Note 5
R84	220KΩ	½		BTS-220K	Note 5
R85	1.5Meg	½		BTS-1.5Meg	Note 5

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: CROSLEY PART No.	Halldorson PART No	Merit PART No	RCA PART No	Stancor TYPE No	Thordarson PART No	Triad PART No
T1	Vert. Osc. Trans.	155355-3	B6702	A-3603	V40S	A-3125	26A03	A-97X
T2	Horiz. Output Trans.	158481-1 ① 158481-2 ②	FB418*			A-8263*	F.LY-25*	D-48*
T3	Vert. Output Trans.	158481-5 ② ① 158726-1						
T4A	Yoke (90°) Horiz(34MH)	158430-1 ④	DF907③④			DY-16A ⑤	Y-16 ⑤	Y-41-1 ⑤
B	Vert(40MH)	158436-1 ④ ⑤						

① Complete assembly includes. Trans. windings: Crosley part no. 158483-1
Trans. Core (3 used): Crosley part no. 158473-1
Mounting Board: Crosley part no. 158605-1
Core Spring: Crosley part no. 158608-1
Terminal Board: Crosley part no. 158479-1

② Alternate horiz. output trans.
③ Alternate vert. output trans.
④ Includes capacitor C76, resistors R57 and R58. Does not include rear cover and centering device, Crosley part no. 153586-1
⑤ Alternate deflection yoke.
⑥ Use original rear cover and centering device.
⑦ Use original yoke damping network.
⑧ To mount replacement same as original, (leads out top) loosen and rotate core clamp 180 degrees. In this position connect the horiz. damping capacitor across terminals #1 and #2, and jumper terminals #3 & #5. If unit is mounted with leads out bottom, connect horiz. damping capacitor across terminals #3 & #7, and jumper terms #1 and #6.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	RCA Replacement Connections	Merit Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
7 - T				7 - T	7 - T	7 - T
8 - 8				8 - 8	8 - 8	8 - 8
3 - 3				3 - 3	3 - 3	3 - 3
5 - 5				5 - 5	5 - 5	5 - 5
2 - 2				2 - 2	2 - 2	2 - 2

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: CROSLEY PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T6	2.2KΩ	3.8Ω	157919-1-1	A-3323	A-3023	S-22X	22U01	26B58	

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V C. IMP	REPLACEMENT DATA: CROSLEY PART No	JENSEN PART No	QUAM PART No	NOTES
SP1	5"	PM	3.8Ω	158733-1-1	ST-105 Mod. P5-X	5A07	
	4"	PM	3.8Ω	136762-5	ST-113 Mod. P4-X	4A1	
	8"	PM	3.8Ω	158632-1	ST-115 Mod. P8-V	8A31	
	5" X 12"	PM	3.8Ω	158734-1			

COILS (RF-IF)

ITEM No.	USE	DC RES: PRI.	SEC.	REPLACEMENT DATA: CROSLEY PART No.	MEISSNER PART No	MERIT PART No.	MILLER PART No	NOTES
L1	Ant. Trans.	0Ω CT	0Ω					
L2	Ant. Coils	0Ω						
L3	Ant. Coupling Coil	0Ω						Low band
L4	Ant. Coil	0Ω						Channel 13
L5	Fil. Choke	0Ω						
L6	RF Coil	0Ω						Channel 13
L7	RF Coils	0Ω						
L8	Mixer Grid Coils	0Ω						
L9	Mixer Grid Coil	0Ω						Channel 13
L10	Fil. Choke	0Ω						
L11	Osc. Coil	0Ω						Tapped - Channel 13
L12	Osc. Coil	0Ω						
L13	Osc. Coils	0Ω						
L14	Conv. Plate	.3Ω						
L15	1st. Video IF	.3Ω		157787-1	17-1003	TV-102	6188	
L16	2nd. Video IF	.3Ω	.3Ω	157789-1	17-1052	TV-116	6250	

CROSLEY MODELS H-1770RWA, TOHWA, TOHWB, TOWHA, TOWHB, TOWHC, H-2120RWA, COHWA, COHWB, COHWC, COSHWA, COSHWB, COSHWC, COWHA, COWHB, COWHC, HCHWA, HCHWB, HCWHA, HCWHB, HCWHC, HPHWA, HPWHA, HPWHB, HPWHC, HPWHD, TOBHA, TOBHB, TOHWA, TOHWB, TOHWC, TOWHA, TOWHB, TOWHC (Ch. 431-1, -3, 432-1, -3, 443, 443-3)

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA CROSLEY PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L17	Fil. Choke	0Ω		155256-1	19-3001	TV-189	6175	.576 Microhenry
L18	3rd. Video IF	.3Ω	.2Ω	155348-1				Includes 21.9MC trap
L19	4th. Video IF	.3Ω	.3Ω	157844-1			6251	
L20	Series Peaking Coil	3.2Ω		154736-1	19-1006		4624	16.5 Microhenries
L21	1st. Sound IF	2.7Ω	.8Ω	157841-1				Includes 4.5MC trap
L22	Shunt Peaking Coil	17Ω		158628-1	19-3500 ■	TV-188 ■	6174 ■	565 Microhenries, wound on 6.8KΩ resistor
L23	Series Peaking Coil	10.5Ω		158627-1	19-3250 ▲	TV-185 ▲	6181 ▲	240 Microhenries, wound on 33KΩ resistor
L24	2nd. Sound IF	1.8Ω	3.4Ω	157856-1				
L25	Quadrature Coil	5Ω		157842-1	20-1005	TV-151	1470	
L26	Horiz. Osc.	125Ω		157791-1	20-1402 *	TV-162 *	6183 *	Tapped @ 87Ω- waveform winding -37Ω

* Reverse coil mounting in can.
■ Parallel with 6.8KΩ resistor.
▲ Parallel with 33KΩ resistor.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA CROSLEY PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L27	.170ADC	55Ω	1.1HY	155529-2-1	C-2326 ①	C-2996 ①	C-21X ①	C5037 ①	26C44 ①

① Drill one new mounting hole.

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA CROSLEY PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.170ADC	155575-2-1	1236A	RS-200	6S300	6Q4	300	
M2	.170ADC	155575-2-1	1236A	RS-200	6S300	6Q4	300	

MISCELLANEOUS

ITEM No.	PART NAME	CROSLEY PART No.	NOTES
M3A	Tuner	D-158847	VHF-Chassis 431-1, 432-1, 431-3, 432-3, 443-3
B	Tuner	D-158674	VHF- Chassis 443
M4	Switch	158799-1	TV-Phono- Chassis 443, 443-3 only
M5	Centering Device	153586-1	Includes yoke cover
M6A	Ion Trap	153109-2	Chassis 431-1, 431-3, 443, 443-3
B	Ion Trap	154924-3	Chassis 432-1, 432-3
B3	Trimmer Cap.	157870-1	Horiz. Lock (10-160MMF)
	Cabinet	158741-2	Less base and legs - Models H-21HPBHa, H-21HPBHd
	Cabinet	158741-3	Less base and legs - Models H-21HPWHa, H-21HPWHd
	Cabinet	158552-1	Less base - Models H-17TOMHa, H-17TOMHd
	Cabinet	158552-2	Less base - Models H-17TOBHa, H-17TOBHd
	Cabinet	158552-3	Less base - Models H-17TOWHa, H-17TOWHd
	Cabinet	158595-1	Less base - Models H-21TOMHa, H-21TOMHd
	Cabinet	158595-2	Less base - Models H-21TOBHa, H-21TOBHd
	Cabinet	158595-3	Less base - Models H-21TOWHa, H-21TOWHd
	Cabinet	158605-1	Models H-21HCMHa, H-21HCMHd
	Cabinet	158605-2	Models H-21HCBHa, H-21HCBHd
	Cabinet	158605-3	Models H-21HCWHa, H-21HCWHd
	Cabinet	158601-1	Less shelf and grille bars - Models H-21COSHa, H-21COSHd
	Cabinet	158601-2	Less shelf and grille bars - Models H-21COSBHa, H-21COSBHd
	Cabinet	158601-1	Less shelf and grille ornament - Models H-21COMHa, H-21COMHd
	Cabinet	158601-2	Less shelf and grille ornament - Models H-21COBHa, H-21COBHd
	Cabinet	158601-3	Less shelf and grille ornament - Models H-21COWHa, H-21COWHd
	Base	158461	Cabinet - Models H-17TOMHa, H-17TOBHa, H-17TOWHa, H-17TOMHd, H-17TOBHd, H-17TOWHd
	Base	158596-1	Cabinet - Models H-21TOMHa, H-21TOBHa, H-21TOWHa, H-21TOMHd, H-21TOBHd, H-21TOWHd
	Base	158784-1	Cabinet Extension - Models H-21HCMHa, H-21HCBHa, H-21HCWHa, H-21HCMHd, H-21HCBHd, H-21HCWHd
	Base	158596-1	Cabinet (Chassis mounting) Models H-21HCMHa, H-21HCBHa, H-21HCWHa, H-21HCMHd, H-21HCBHd, H-21HCWHd, H-21HPBHa, H-21HPBHd, H-21HPWHa, H-21HPWHd
	Base	158784-2	Cabinet Extension - Models H-21HPBHa, H-21HPBHd, H-21HPWHa, H-21HPWHd
	Shelf	158602-1	Cabinet - Models H-21COSHa, H-21COSBHa, H-21COMHa, H-21COBHa, H-21COWHa, H-21COSHd, H-21COSBHd, H-21COMHd, H-21COBHd, H-21COWHd
	Grille Bar	158789-1	Models H-21COSHa, H-21COSHd
	Grille Bar	158789-2	Models H-21COSBHa, H-21COSBHd
	Grille Ornament	158720-1	Models H-21HCMHa, H-21HCWHa, H-21HCMHd, H-21HCWHd, H-21HPWHa, H-21HPWHd
	Grille Ornament	158720-2	Models H-21HCBHa, H-21HCBHd, H-21HPBHa, H-21HPBHd
	Grille Ornament	158708-1	Models H-21COMHa, H-21COMHd
	Grille Ornament	158708-2	Models H-21COBHa, H-21COBHd
	Leg	158713-1	4 Used - Models H-21HCMHa, H-21HCMHd
	Leg	158713-2	4 Used - Models H-21HCBHa, H-21HCBHd, H-21HPBHa, H-21HPBHd
	Leg	158713-3	4 Used - Models H-21HCWHa, H-21HCWHd, H-21HPWHa, H-21HPWHd
	Knob	157753-3	Channel Selector - Models H-17TOMHa, H-17TOBHa, H-17TOWHa, H-17TOMHd, H-17TOBHd, H-17TOWHd
	Knob	157753-4	Channel Selector - All models except H-17TOMHa, H-17TOBHa, H-17TOWHa, H-17TOMHd, H-17TOBHd, H-17TOWHd
	Knob	157750-1	Control - 4 used (All models with the exception that in models H-21HPBHa, H-21HPBHd, H-21HPWHa and H-21HPWHd, 6 control knobs are used)
	Knob	157754-1	Fine tuning - All models
	Mask	158260-4	Models H-17TOMHa, H-17TOBHa, H-17TOWHa, H-17TOMHd, H-17TOBHd, H-17TOWHd
	Mask	158419-2	All models except H-17TOMHa, H-17TOBHa, H-17TOWHa, H-17TOMHd, H-17TOBHd, H-17TOWHd
	Safety Glass	155350-19	Models H-17TOMHa, H-17TOBHa, H-17TOWHa, H-17TOMHd, H-17TOBHd, H-17TOWHd
	Safety Glass	155350-18	All models except H-17TOMHa, H-17TOBHa, H-17TOWHa, H-17TOMHd, H-17TOBHd, H-17TOWHd

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet below the channel selector shaft.

PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove 3 wood screws holding metal molding at the bottom of the safety glass. Remove molding and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions.)

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of the chassis. Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (L26) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, it is necessary to remove rear cover and supply power to set. Adjust the buzz control (R5) for maximum volume and minimum buzz.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 6 push-on type control knobs from side panel of cabinet.
2. Remove 6 wood screws. Remove rear cover.
3. Remove 1 metal screw from antenna bracket.
4. Remove 2 metal screws from top chassis brackets (2).
5. Disconnect 2 speaker leads.
6. Remove 6 chassis mounting board bolts. (Three located on each side of cabinet bottom.)
7. Remove 1 wood screw from front under side of cabinet.
8. Remove 2 wood screws from 2 rear cabinet braces.
9. Slide cabinet forward and lift cabinet off of mounting board.
10. Remove 2 speaker nuts. Remove speaker.

PICTURE TUBE REMOVAL (From Mounting Board)

1. Remove picture tube socket, HV lead and ion trap.
2. Loosen 2 front tube mounting band bolts.
3. Remove picture tube.

PRODUCTION CHANGES

PICTURE TUBE REPLACEMENT

When the picture tube is replaced, better focus may be obtained by connecting the focus anode (pin 6 - V16) to a point other than the 150V line. Points to try are: Chassis ground, 260V line, 285V line and 480V line.

VERTICAL COMPRESSION

Occasionally the individual characteristics of the 12BH7 (V10) and the vertical output transformer (T3) combine in such a way that the top of the picture is slightly compressed.

This condition may be corrected by removing the jumper across R55 to bring the linearity control (R7) and the height control (R6) into effective range.

When replacing the 12BH7 (V10) or the vertical output transformer (T3) check the effective range of the vertical linearity control (R7) and the height control (R6) before removing or jumping R55.

TO ELIMINATE ARC-OVER

In late production of chassis 431-1 (code letter "B") the triode sections of the 12BH7 (V10) are reversed to eliminate the tendency of arc-over between pin 6 (vertical output plate) and pin 5 (filament) when the height control is misadjusted.

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DENVER, COLORADO

FIRESTONE
4-A-131

TRADE NAME	Firestone Model 4-A-131 (Code 364-4 -PA5)
SUPPLIER	Firestone Tire & Rubber Co., 1200 Firestone Pkwy., Akron, Ohio
TYPE SET	AC Operated Phono Amplifier With 3 Speed Automatic Record Changer
TUBES (Three)	Types 12AT6 AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	RATING .21 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT - SEE V-M MODEL 950 - PHOTOFACT SET #216 — FOLDER 11 or RECORD CHANGER MANUAL CM-5.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

FIRESTONE
MODEL 4-A-131 (Code 364-4-PA5)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		FIRESTONE PART No.	STANDARD REPLACEMENT		
V1	AF Amplifier	12AT6	12AT6	7BT	
V2	Audio Output	50C5	50C5	7CV	
V3	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT	FIRESTONE PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	40	150	1010-A						
B	40	150							
C	20	150							
D	20	25							
C2	330		†	D6-331	GP2K-331	UC-5333		K-1333	
C3	5000			DD-502	811-005	DC-525	IMP6-D5	C-1250	Note 1
C4	10000		819B	DD-103	811-01	DC-511	IMP6-S1	330611	
C5	1500		821	DD-152	801-0015	DC-5215	IMP6-D15	C-1215	
C6	.1	200	804	DF-104		PT401	IMP2-P1	330201	

Note 1. Some versions use 10000MMF in this application (part #819-B).
† Items C2 and R3 are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	FIRESTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	2Meg	½	412A	Q13-139	A47-2Meg-Z	AB-76	U-55	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	KB-1	US-26	Attach to R1A
R2A	500KΩ	½	R3027	Q13-133	A47-500K-Z	AB-60	U-48	Tone - Note
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A

Note. Some versions may use an alternate control part #408.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	FIRESTONE PART No.	IRC PART No.	
R3	1Meg	½	†516	BTS-1Meg	
R4	470KΩ	½		BTS-470KΩ	
R5	5Meg	½	525	BTS-5Meg	
R6	470Ω	½	541	BTS-470	
R7	100KΩ	½	507	BTS-100K	
R8	470KΩ	½		BTS-470K	

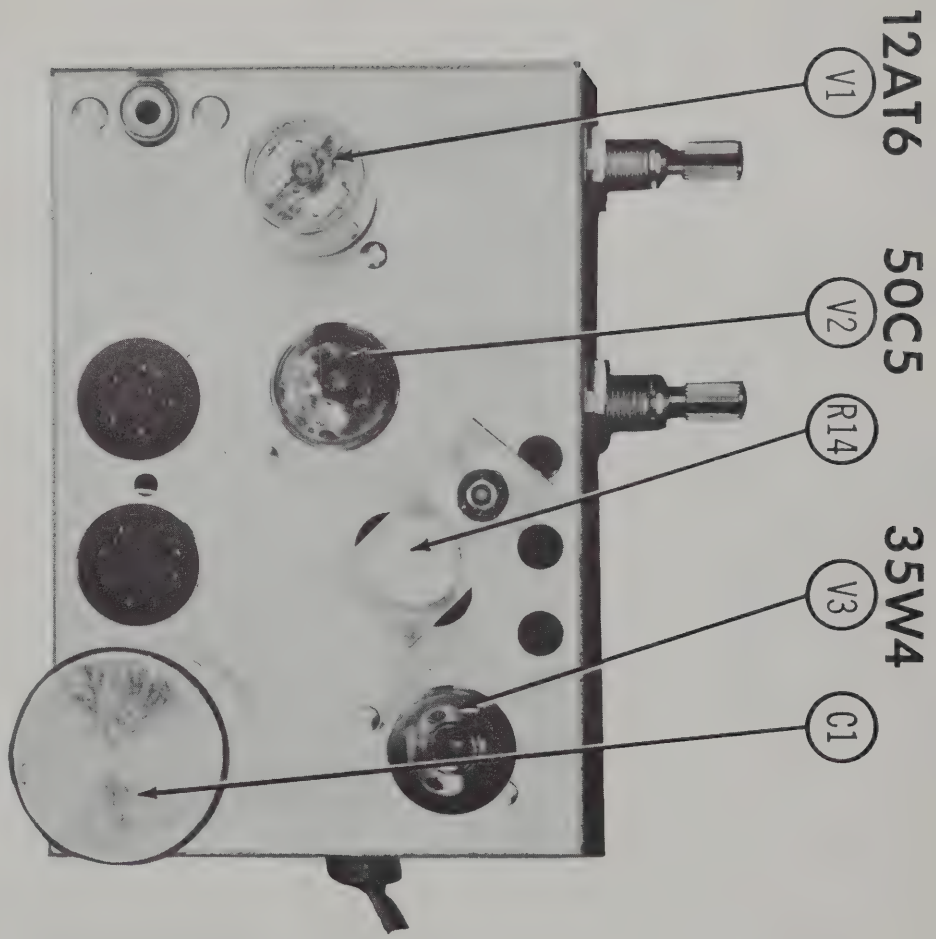
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	FIRESTONE PART No.	IRC PART No.	
R9	150Ω	½	505	BTS-150	
R10	1Meg	½	516	BTS-1Meg	
R11	1000Ω	½	539	BTS-1000	
R12	470Ω	1		BTA-470	Note 1
R13	50Ω	½	534	BTS-47	Note 2
R14	120Ω	5	625		

† Items R3 and C2 are combined in one unit.
Note 1. Some versions use a 270Ω resistor in this application.
Note 2. Some versions use a 30Ω resistor in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	FIRESTONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.4KΩ	3.4Ω	Part of Spkr.	A-3876	A-2928	S-1X	Z1001	22S46	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	FIRESTONE PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	2564	55-T	GD-J	47	0-1 or S-1 & 0-3	

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

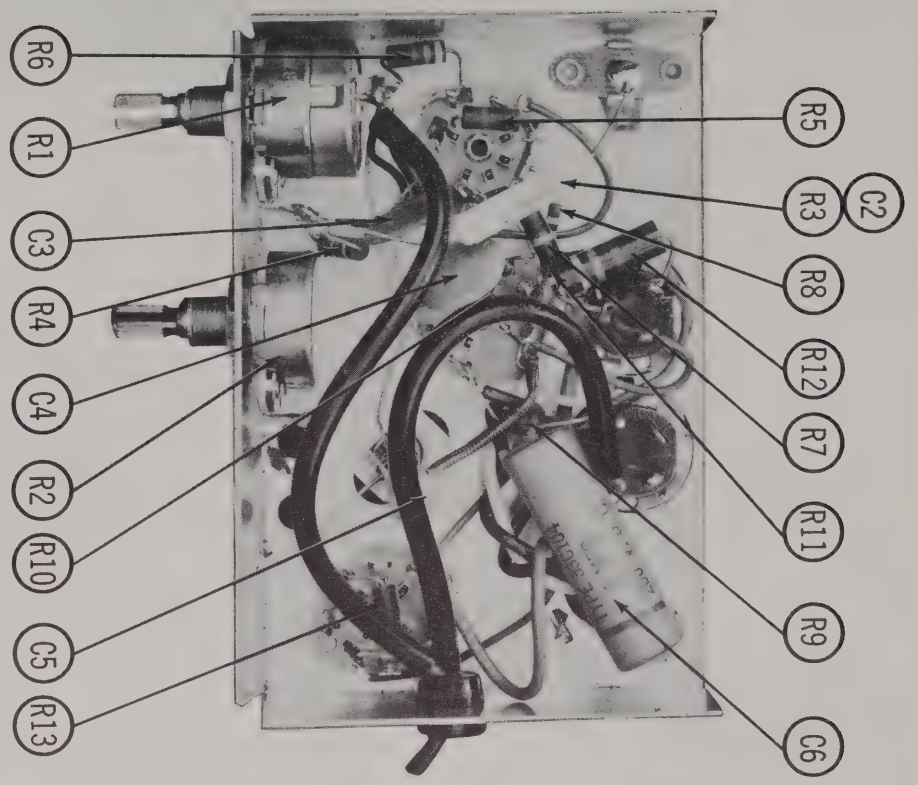
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	FIRESTONE PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M2	2564-A	* S-67 or †S-66 or ♦†S-66SD or ♦S-66D	†AC-434 or ♦†AC-434D1 or †♦AC-434D2 or ♦AC-434D	†W-75TPS or ♦†W-75DS or ♦W-75TPD	* Metal † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
	Case	2052	
	Knob	2416	Tone and Volume

CHASSIS—BOTTOM VIEW



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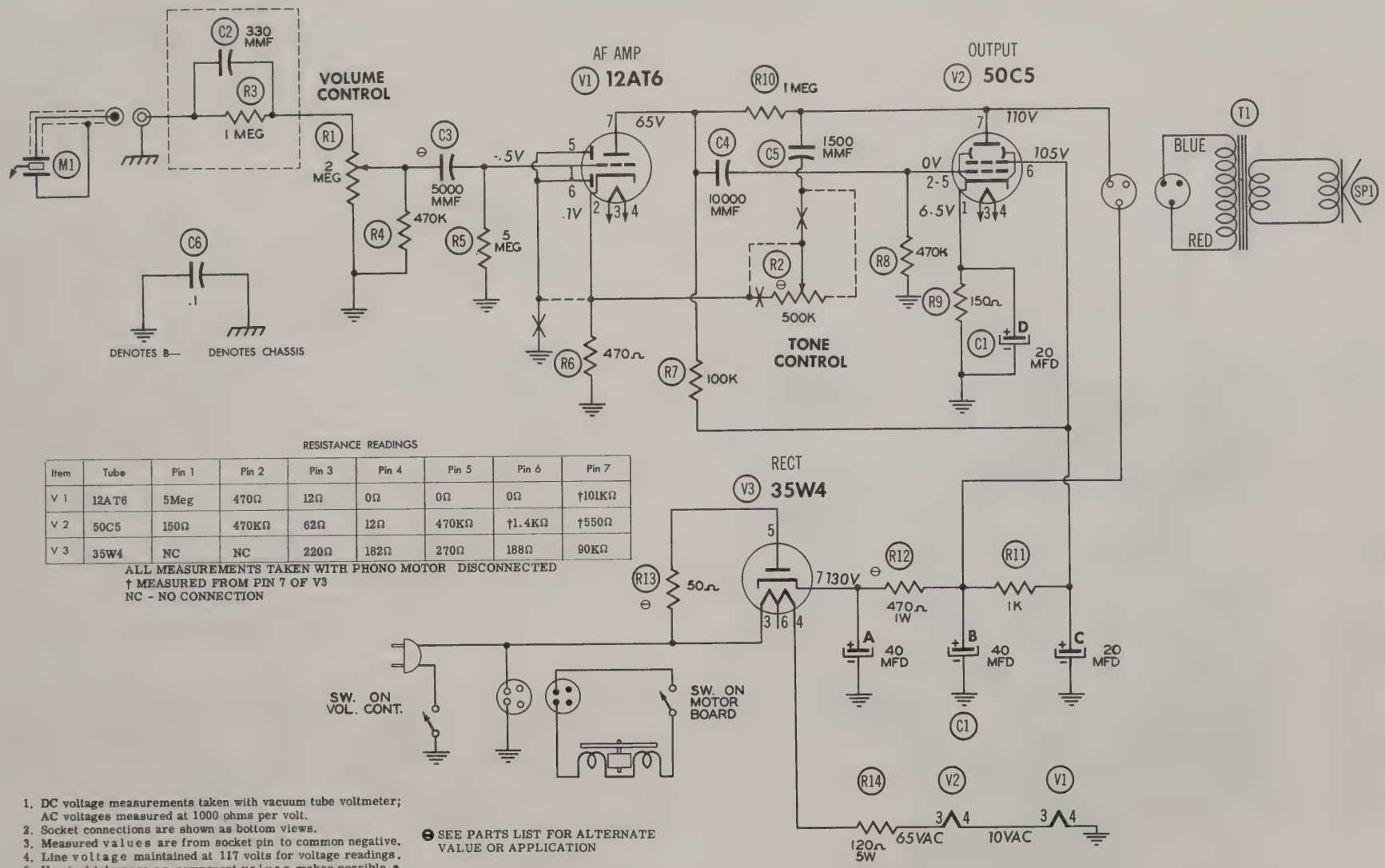
FIRESTONE
MODEL 4-A-131 (Code 364-4-PA5)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12AT6	5Meg	470Ω	12Ω	0Ω	0Ω	0Ω	†101KΩ
V 2	50C5	150Ω	470KΩ	62Ω	12Ω	470KΩ	†1.4KΩ	†550Ω
V 3	35W4	NC	NC	220Ω	182Ω	270Ω	188Ω	90KΩ

ALL MEASUREMENTS TAKEN WITH PHONO MOTOR DISCONNECTED
† MEASURED FROM PIN 7 OF V3
NC - NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

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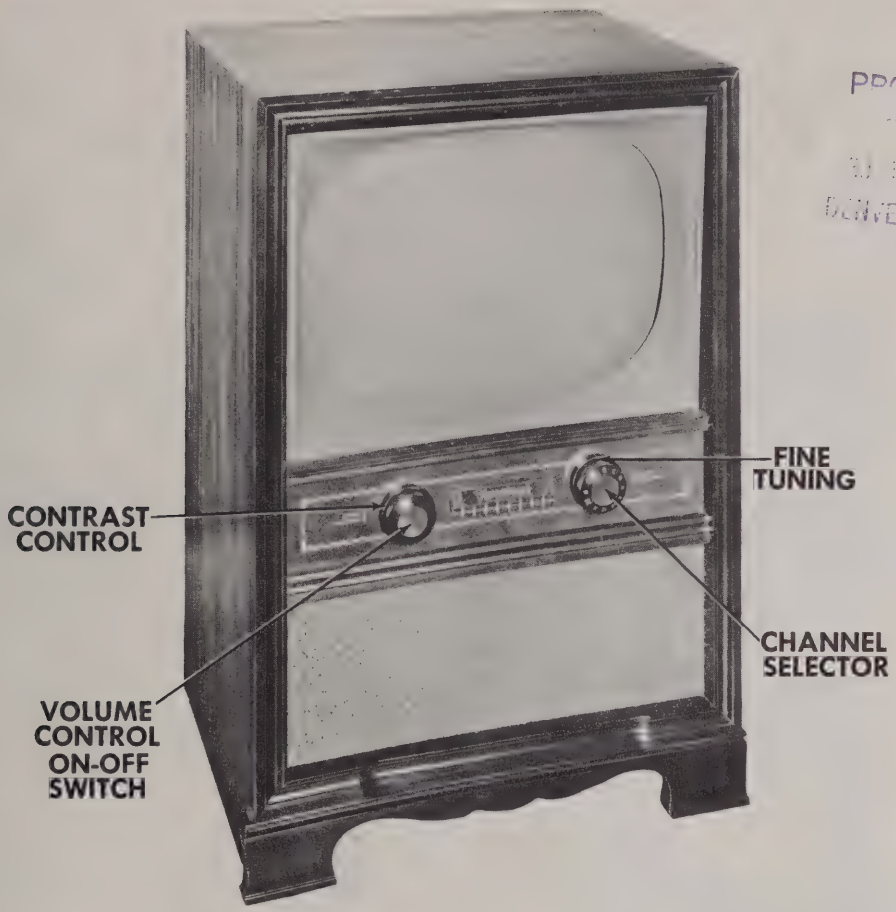

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FIRESTONE MODEL 13-G-178

TRADE NAME	Firestone Models 13-G-176, 13-G-178, 13-G-179 (Code 334-4-AM51A)
SUPPLIER	Firestone Tire & Rubber Co., 1200 Firestone Parkway, Akron, Ohio
TYPE SET	Television Receiver
TUBES	Twenty-three
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 1.7 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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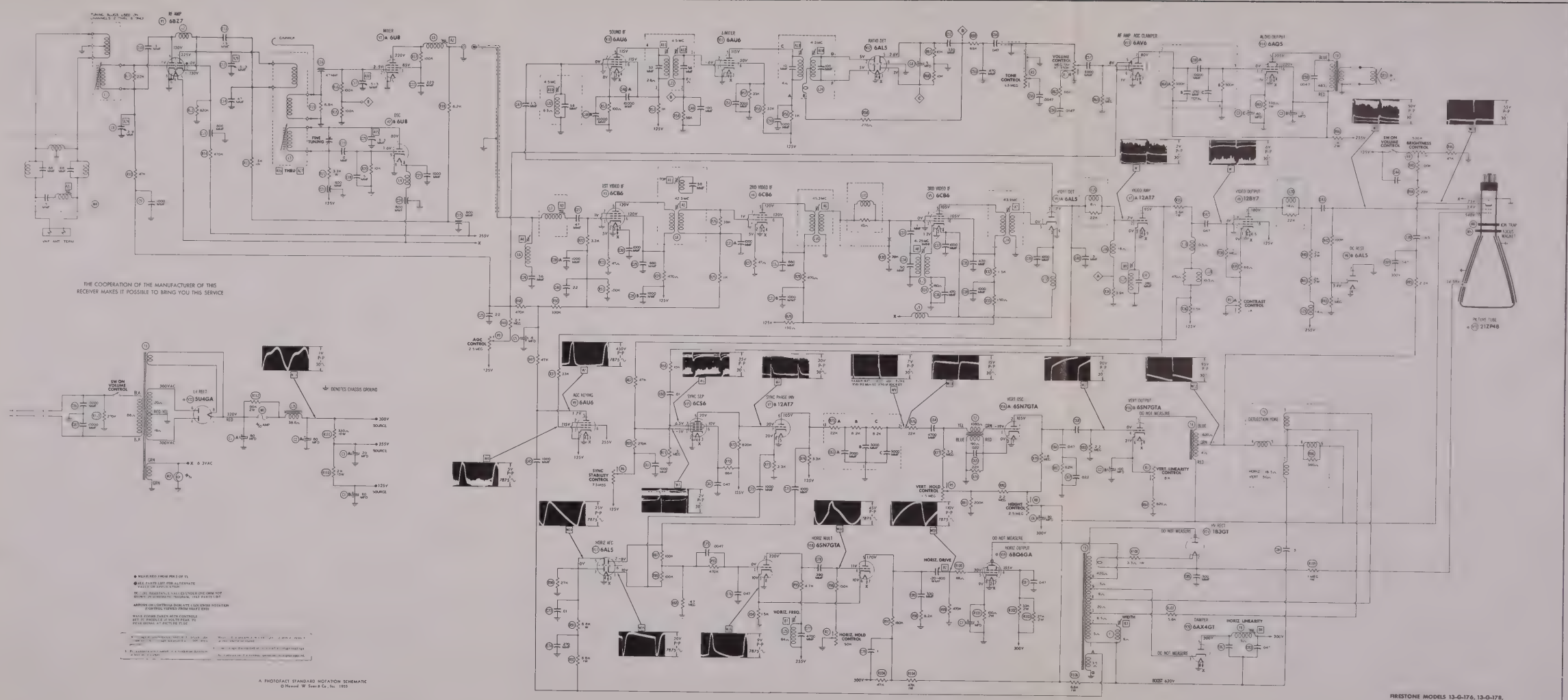
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CHASSIS TOP VIEW

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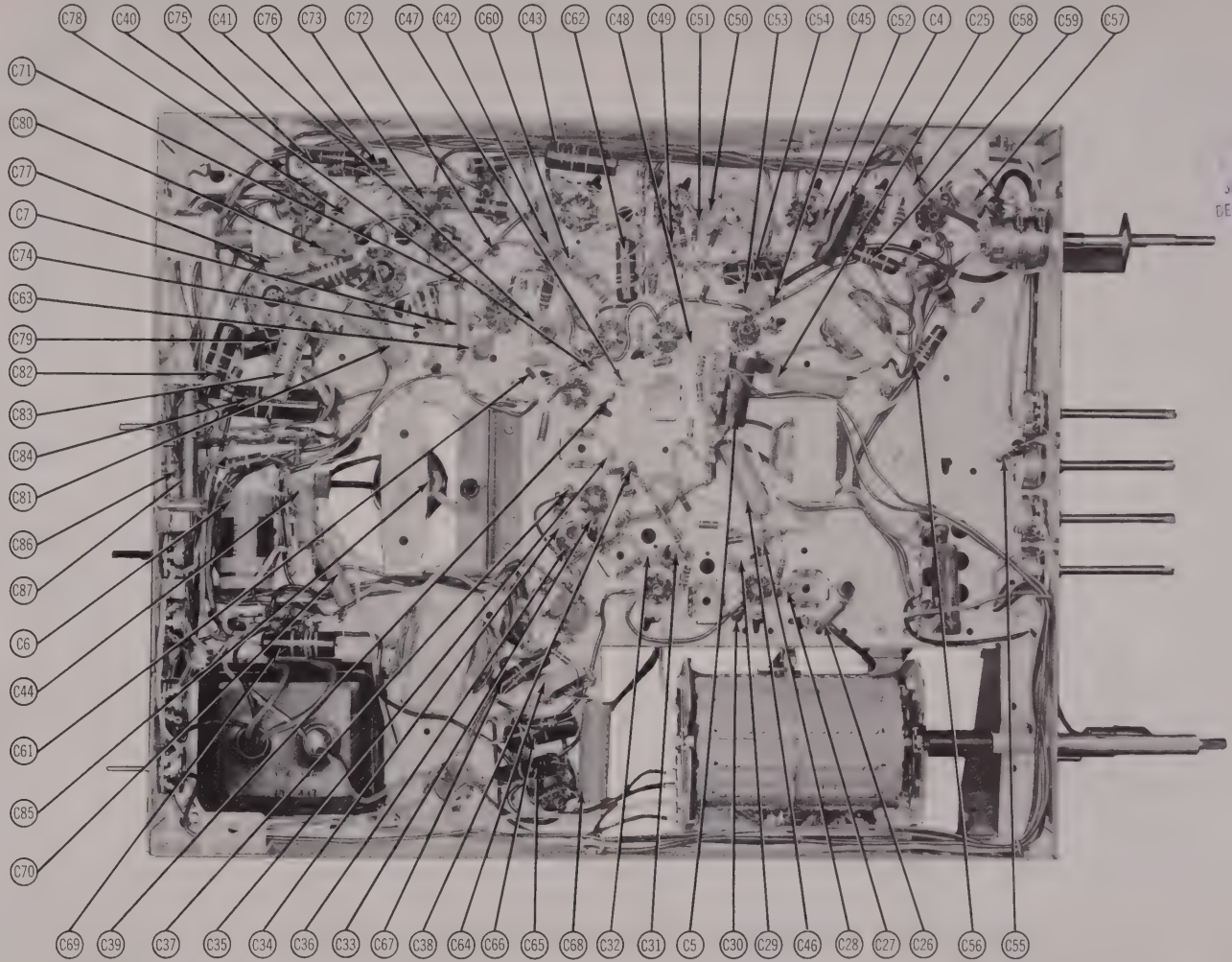

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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TUBE PLACEMENT CHART

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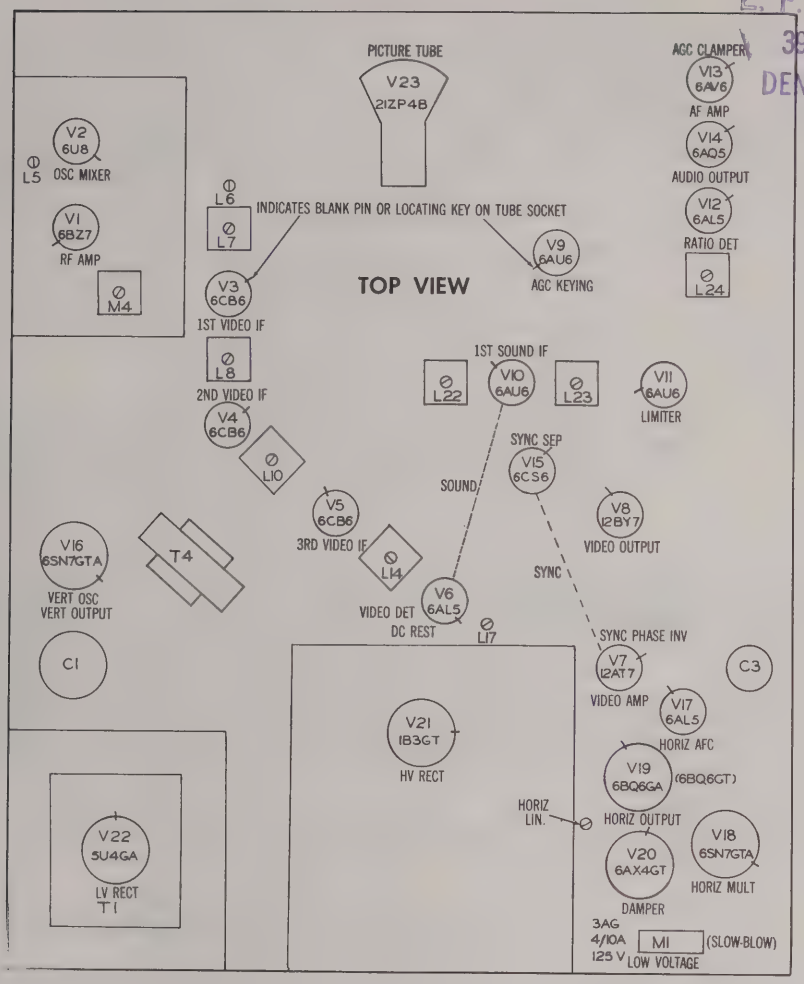

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V22, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V7, V8, V9, V23
Has pic, no sound - V10, V11, V12, V13, V14
Overloaded picture - V9, V13

SYNC FAILURE
No vert. sync - V7, V16
No horiz. sync - V7, V17, V18
No vert. or horiz. sync - V7, V15

SWEEP FAILURE
No raster, has sound - V18, V19, V20, V21, V23
No vertical deflection - V16
Poor vert. linearity or foldover - V16
Poor horiz. linearity or foldover - V18, V19, V20
Narrow picture - V18, V19, V20, V21, V22
Vert. off freq. - V7, V16
Horiz. off freq. - V7, V17, V18

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5 volt battery to the ungrounded side of C28A. Connect the positive lead to chassis.
Remove the RF amplifier tube (V1) from its socket.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube (V2). Low side to tuner chassis.	44MC (10MC Swp)	41.25MC 45.75MC 47.25MC	Any unused channel.	Vert. amp. thru detector (Fig. 1) to pin 5 (plate) of 6CB6 (V3). Low side to chassis.	A1, A2, A3, A4	Adjust A1 to place 47.25MC marker in trap notch as in Fig. 2. Adjust A2, A3 and A4 for response similar to Fig. 2. A2 and A3 affect the flat portion of curve. A4 positions the 41.25MC marker. Make sure 45.75MC marker is on peak as shown or 44.5MC marker on overall response will be incorrect.
2.	"	"	Not used.	42.5MC (Unmod)	"	Use VTVM. DC probe to point Ⓐ. Common to chassis.	A5	Increase bias from 1.5 volts to 4.5 volts at ungrounded side of C28A. Attenuate generator output to maintain 1 volt at VTVM. Adjuse for maximum deflection.
3.	"	"	"	45.3MC	"	"	A6	"
4.	"	"	"	43.9MC	"	"	A7	"
5.	"	"	"	41.25MC	"	"	A8	Adjust for MINIMUM deflection.
6.	"	"	44MC (10MC Swp)	41.25MC 42.25MC 42.5MC 43.9MC 44.5MC 45.3MC 45.75MC 47.25MC	"	Vert. amp. thru 10KΩ to point Ⓐ. Low side to chassis.		Check for response curve similar to Fig. 3. SLIGHTLY retouch A5 thru A8 to obtain desired response. If A1 thru A4 requires retouching, step 1 should be repeated.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	10KΩ	High side thru 10KΩ to pin 2 (plate) of 6AL5 (V6A). Low side to chassis.	Not used.	4.5MC (400∿ Mod)	Any unused channel.	Vert. amp. to pin 2 (grid) of picture tube. Low side to chassis.	A9	Adjust for MINIMUM 400∿ indication on scope.

ALTERNATE 4.5MC TRAP ALIGNMENT

Replace the RF amplifier tube (V1) and remove bias battery. Tune in a TV station and adjust A9 for minimum 4.5MC beat interference in picture.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Remove 6CB6 (V5) from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	10KΩ	High side thru 10KΩ to pin 2 (plate) of 6AL5 (V6A). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point Ⓑ. Common to chassis.	A10, A11, A12	Adjust for maximum deflection.
9.	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A13	Use only enough generator output to provide usable indication on VTVM. Adjust for maximum deflection.
10.	"	"	"	"	DC probe to point Ⓓ. Common to chassis.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Replace V5 in its socket.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Remove 6CB6 (V5) from its socket.
Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	10KΩ	High side thru 10KΩ to pin 2 (plate) of 6AL5 (V6A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp. to point Ⓑ. Low side to chassis.	A10, A11, A12	Adjust for curve of maximum amplitude and symmetry similar to Fig. 4.
9.	"	"	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A13	Disconnect stabilizing capacitor C4. Use only enough sweep generator output to provide usable indication on scope. Adjust for curve of maximum amplitude and symmetry similar to Fig. 4.
10.	"	"	"	"	"	Vert. amp. to point Ⓓ. Low side to chassis.	A14	Reconnect stabilizing capacitor C4. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 5. SLIGHTLY retouch A13 for maximum amplitude and straightness of crossover lines. Replace V5 in its socket.

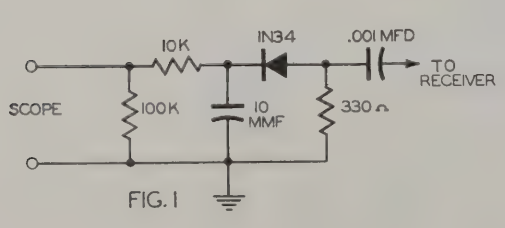

FIG. 1

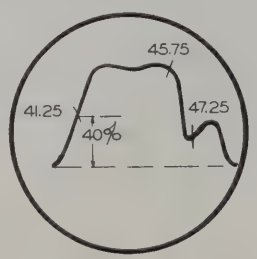

FIG. 2

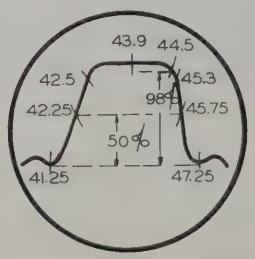

FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT

Connect the negative lead of a 4.5 volt battery to the ungrounded side of C28A. Positive lead to chassis.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels, it may be possible to correct them in one step using A15 adjustment. It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel. If adjustment of A15 will not bring all channels well within range of the fine tuning control, it will be necessary to adjust the channel strip adjustment screw for each channel that is off frequency. The channel oscillator adjustment screws are reached through a hole just to the left of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel. Replace the RF amplifier (V1) in its socket.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω carbon resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp. thru 10KΩ to point (A). Low side to chassis.	A16	Adjust to place sound marker in trap notch as in Fig. 6. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A17	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A18	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A19	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A20	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A21	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A22	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A23	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A24	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A25	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A26	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A27	

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RF AND MIXER ALIGNMENT

Connect the negative lead of a 3 volt battery to the ungrounded side of C25. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω carbon resistors	Across VHF antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. amp. thru 10KΩ to point (E). Low side to chassis.	A28, A29 A30	Adjust for response similar to Fig. 7 with markers above 90%.
13.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		If markers fall below 70% on any channel, make compromise adjustment of A28, A29 and A30 with channel switch set to that channel. Then check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

IF WAVE TRAP ADJUSTMENT

The IF wave trap should be tuned to minimize interference caused by signals which fall within the video IF bandpass (40-48MC). Tune in a station on which the interference is noted and adjust A31 for minimum interference in the picture.

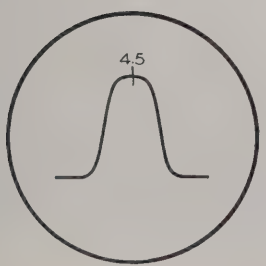


FIG. 4

FIG. 5

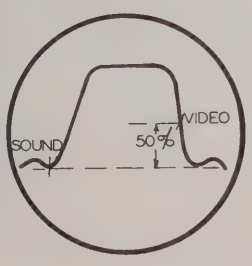


FIG. 6

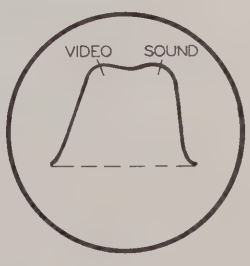
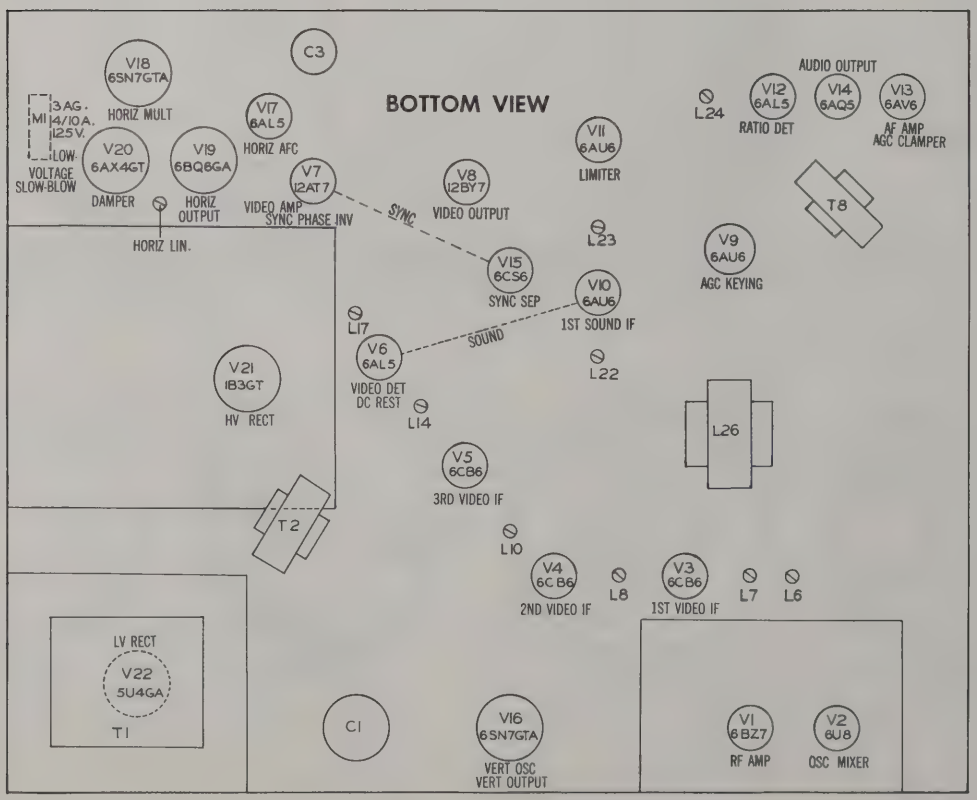


FIG. 7

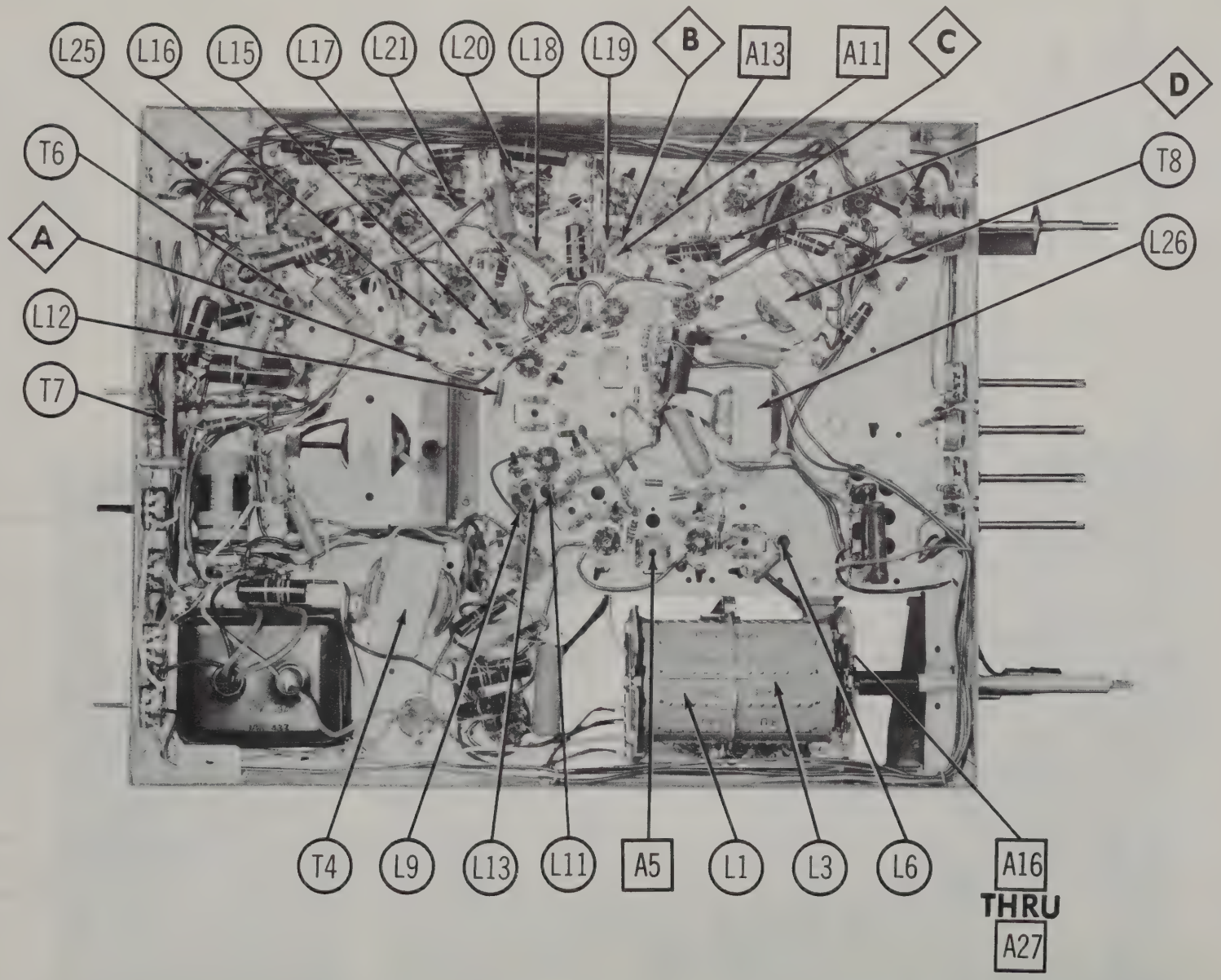
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BZ7	†1. 8KΩ	†300KΩ	INF	0Ω	. 1Ω	INF	750KΩ	0Ω	0Ω
V 2	6U8	†5. 5KΩ	200KΩ	†100KΩ	. 1Ω	0Ω	†8. 5KΩ	0Ω	0Ω	10KΩ
V 3	6CB6	80KΩ	47Ω	0Ω	. 1Ω	†2. 8KΩ	†2. 8KΩ	0Ω		
V 4	6CB6	80KΩ	47Ω	0Ω	. 1Ω	†3KΩ	†3KΩ	0Ω		
V 5	6CB6	. 2Ω	180Ω	0Ω	. 1Ω	†4KΩ	†4KΩ	0Ω		
V 6	6AL5	1Meg	3. 9KΩ	. 1Ω	0Ω	. 5Ω	0Ω	0Ω		
V 7	12AT7	†9KΩ	3. 9KΩ	. 2Ω	0Ω	0Ω	†5. 5KΩ	†820KΩ	3. 3KΩ	. 1Ω
V 8	12BY7	450Ω	1Meg	0Ω	. 1Ω	. 1Ω	0Ω	†4. 5KΩ	†2. 5KΩ	0Ω
V 9	6AU6	†35KΩ	†2. 3KΩ	. 1Ω	0Ω	350KΩ	†400Ω	†2. 3KΩ		
V 10	6AU6	6. 5Ω	0Ω	0Ω	. 1Ω	†3. 3KΩ	†3. 3KΩ	100Ω		
V 11	6AU6	56KΩ	0Ω	. 1Ω	0Ω	†3. 3KΩ	†27KΩ	0Ω		
V 12	6AL5	INF	INF	. 1Ω	0Ω	10KΩ	0Ω	10KΩ		
V 13	6AV6	10Meg	0Ω	. 1Ω	0Ω	750KΩ	750KΩ	†500KΩ		
V 14	6AQ5	500Ω	330Ω	0Ω	. 1Ω	†1. 8KΩ	†1. 3KΩ	500KΩ		
V 15	6CS6	40KΩ	0Ω	. 1Ω	0Ω	†820KΩ	†70KΩ	1. 5Meg		
V 16	6SN7GTA	4Meg	▲2. 5Meg	190Ω	2. 2Meg	▲8. 5KΩ	2. 2KΩ	0Ω	. 1Ω	
V 17	6AL5	4. 8Meg	4. 8Meg	. 1Ω	0Ω	8. 5KΩ	NC	8. 5KΩ		
V 18	6SN7GTA	5Meg	†5KΩ	1. 5KΩ	180KΩ	†200KΩ	1. 5KΩ	. 1Ω	0Ω	
V 19	6BQ6GA	TP	0Ω	TP	†15KΩ	470KΩ	TP	. 1Ω	100Ω	Top Cap ▲15Ω
V 20	6AX4GT	TP	NC	120KΩ	TP	†55Ω	NC	. 1Ω	0Ω	
V 21	1B3GT		PINS	1 - 8	HAVE	INFINITE	RESISTANCE			Top Cap ▲435Ω
V 22	5U4GA	INF	30KΩ	INF	20Ω	INF	19Ω	INF	30KΩ	
V 23	21ZP4B	0Ω	1. 1Meg	Pin 10 ▲6. 8KΩ	Pin 11 †250KΩ	Pin 12 . 1Ω				

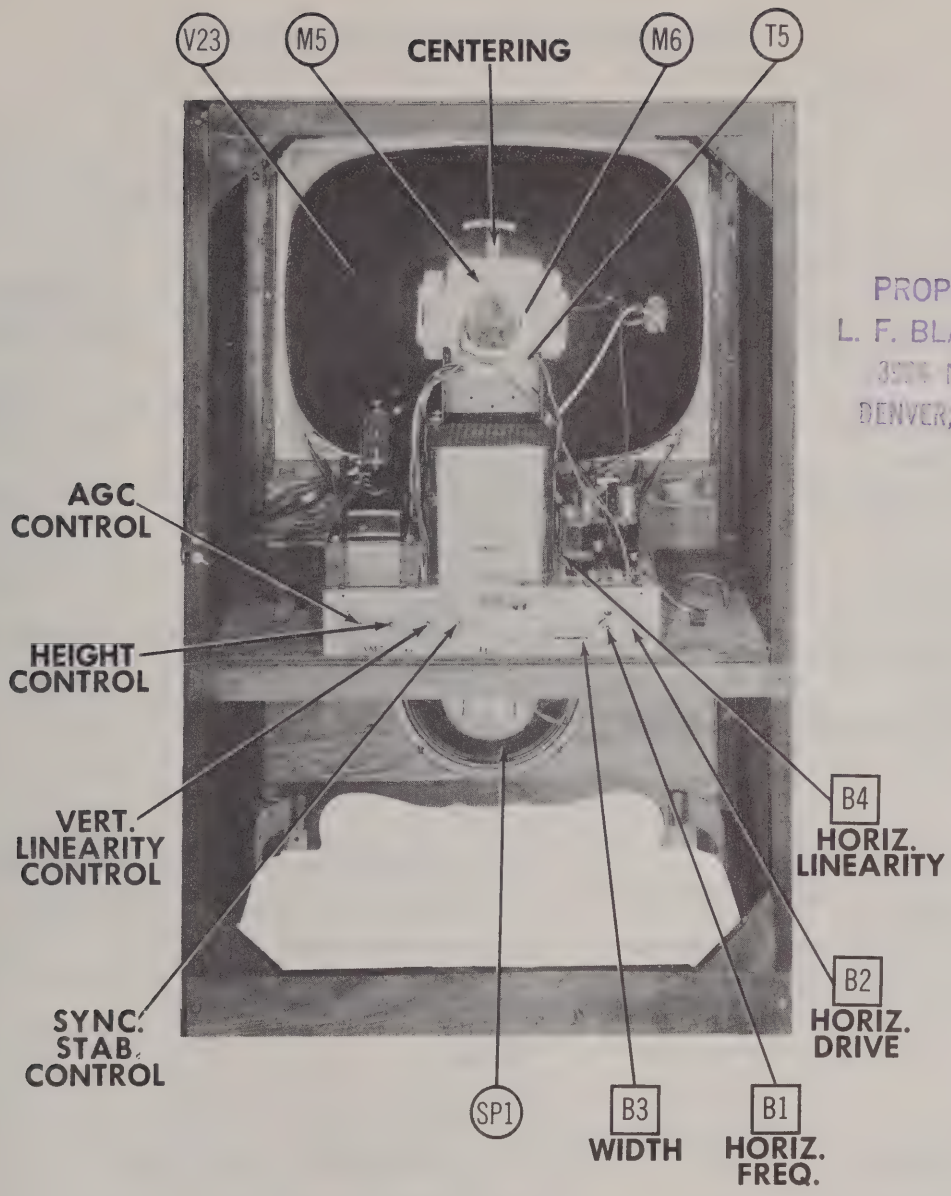
† MEASURED FROM PIN 2 OF V22.
▲ MEASURED FROM PIN 3 OF V20.
TP - TIE POINT
NC - NO CONNECTION



TUBE PLACEMENT CHART



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



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CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern. If horizontal hold control fails to maintain sync, set it in the middle of its range and adjust the horizontal frequency slug B1 until the picture is in sync.

Check other channels and if necessary, readjust B1 slightly for best sync on all channels. With picture locked in sync, turn contrast control (R1A) to minimum, adjust brightness control for a washed-out picture.

Adjust the width control (B3) for a picture slightly wider than necessary to fill mask horizontally.

Turn horizontal drive trimmer (B2) inward (if necessary) until horizontal drive line disappears.

Adjust horizontal linearity slug (B4) for a picture that is symmetrical from left to right. Adjust the picture centering device located in front of focus magnet to center picture in the mask.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V19, V20 and V22. Check adjustments B2, B3 and B4. Check T3, T5A, R102, R103, C80, C7 and other associated components.

DRIVE LINES

Check by substitution V19 and V20. Check adjustments B2 and B4. Check R102, R103, T3, T5A and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V19 and V20. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V18, V19 and V20. Check C76 for open. Check L25, C77, C75, R94 and other associated components.

XMAS TREE EFFECT

Check by substitution V18, V19 and V20. Check T3 and T5 for internal arcing. Check C74, C73, C77, C78, L25, R91, R92, R96 and other associated components.

VERTICAL

LOSS OF SWEEP

Substitute V16. Check waveform W11.

If Satisfactory	If Unsatisfactory
Check T4, T5B, R84, C2B and other associated components.	Check C66, C68, R79, R8, R106, R77, T2 and other associated components.

INSUFFICIENT SWEEP

Substitute V16. Check height and vertical linearity controls for proper operation. Check R79, T4 and other associated components.

COMPRESSED AT BOTTOM

Substitute V16. Check R106, R8, R79, C68, T2 and other associated components.

COMPRESSED AT TOP

Substitute V16. Check R84, R7, C2B, C68, T4 and other associated components.

FOLDS

Substitute V16. Check C66, C67, C68, R82 and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V15 and V7. Check C60, C62, R68, R70, R72, R74 and other associated components.

LOSS OF VERTICAL SYNC - HORIZONTAL SYNC SATISFACTORY

Substitute V16. Check vertical integrator network. Check R77, R5, R78, T2, C64 and other associated components.

LOSS OF HORIZONTAL SYNC - VERTICAL SYNC SATISFACTORY

Check by substitution V17 and V18. Check horizontal AFC network. Check C71, C72, L25, R96, R2, R94 and other associated components.

HORIZONTAL BENDING

Check by substitution V7, V15, V17 and V18. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Check by substitution V7 and V8. Check C42, C43, R35, R36, R40, R41, L18, L21 and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustment A9. Check video IF alignment.

POOR CONTRAST

Check by substitution V7 and V8. Check contrast control. Check L19, L20, L15, C42, C43 and other associated components.

NEGATIVE PICTURE

Check by substitution V7 and V8. Check picture tube. Check L16, L19, L20, C42, C43, R39 and other associated components.

SMEAR

Check by substitution V7 and V8. Check L15, L16, L19, L20, C42, C43 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V1, V3, V4, V5, V6, V7 and V8 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V10, V11, V12, V13 and V14. Check stages V13 and V14 using audio signal generator. Apply audio signal across R1B.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF stages for component failure or change of value.	Check C54, C57, C58A, C59, C3C, C3B, R66, R64A, T8, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A14 for minimum buzz. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly. Check switch on volume control and T1. If filaments light, check M1 fuse. Substitute V22. Check B+ filter and decoupling network.

SMALL AND/OR DIM PICTURE

Substitute V22. Check B+ filter and decoupling network.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amp.	6BZ7	6BZ7	9AJ	
V2	Mixer-Osc.	6U8	6U8	9AE	
V3	1st Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Det-DC Restorer	6AL5	6AL5	6BT	
V7	Video Amp-Sync Phase Inv.	12AT7	12AT7	9A	
V8	Video Output	12BY7	12BY7	9BF	
V9	AGC Keying	6AU6	6AU6	7BK	
V10	1st Sound IF Amp.	6AU6	6AU6	7BK	
V11	Limiter	6AU6	6AU6	7BK	
V12	Ratio Det	6AL5	6AL5	6BT	
V13	AF Amp-AGC Clamper	6AV6	6AV6	7BT	
V14	Audio Output	6AQ5	6AQ5	7BZ	
V15	Sync Sep.	6CS6	6CS6	7CH	
V16	Vert. Osc. Vert. Output	6SN7GTA	6SN7GTA	8BD	
V17	Horiz. AFC	6AL5	6AL5	6BT	
V18	Horiz. Mult.	6SN7GTA	6SN7GTA	8BD	
V19	Horiz. Output	6BQ6GA	6BQ6GA	6AM	6BQ6GT used as an alternate
V20	Damper	6AX4GT	6AX4GT	4CG	
V21	HV Rectifier	1B3GT	1B3GT	3C	
V22	LV Rectifier	5U4GA	5U4GA	5T	5U4G used as an alternate

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: FIRESTONE PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V23	21ZP4B ①	21ZP4B ① 21ZP4A	21ZP4B ① 21ZP4A	21ZP4B① 21ZP4A 21ZP4 ②	21ZP4B ① 21ZP4A	12N 12N	① Aluminized ② Circuit change necessary

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: FIRESTONE PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	NOTES
C1A	▲80	400	45X390			FP229.4	TM-D80-450	T-180	
B	▲60	400							
C2A	▲80	400	45X391			FP229.8	TM-3057	T-720	
B	▲100	50							
C3A	■20	400	45X392			FP366	TM-3037	T-700	
B	▲10	400							
C	40	50							
C4	5	25	45X378			TC30	TD-5-25	MMT-0505	
C5	4	100	45X361			TC40	TD-4-150	FM-1504	
C6	30	400	45X393			TC77	TD-30-450	FM-4530	
C7	5	25	45X378			TC30	TD-5-25	MMT-0505	
C8	3-9		31A-079	829-10					
C9	1000		13L-8X102Z	DD-102	801-001	DC-521			
C10	3		13L-8C030K	TCZ-3	NP0A-030	ZT-5533			
C11	800		13M-28N102Z-03						
C12	.5-3		31A-056-1	829-3	3115-01-0R5	CT-565A			
C13	1.5		13L-8C1R5C	TCZ-1.5	NP0A-1R5	ZT-5515			
C14	47		13L-8Q470K	D6-470	831-470	UC-5447			
C15	800		13M-28N102Z-03						
C16	47								
C17	.5-3		31A-056-1	829-3	3115-01-0R5	CT565A			
C18	5		13L-8UA050C						
C19	10		13L-8T100A						
C20	.5-3		31A-056-1	829-3	3115-01-0R5	CT565A			
C21	800		13M-28N102Z-03						
C22	220		13L-12D221K	D6-221	811-221	UC-5322			
C23	1000		13L-8X102Z	DD-102	801-001	DC-521			
C24	800		13M-28N102Z-03						
C25	.22	200	RCP10M2224M			PT4022	IMP2-P22	3302022	
C26	36		47X626						
C27	47		47X603	D6-470	GP1K-470	UC-5447		K-1447	
C28A	1000		80X3	DD2-102	812-001	DCD-521			
B	1000								
C29	680		80X5	DD-681	811-681	UC-5368			
C30	1000		80X1	DD-102	801-001	DC-521			
C31A	1000		80X3	DD2-102	812-001	DCD-521			
B	1000								
C32	680		80X5	DD-681	811-681	UC-5368			
C33	1		47X588	TCZ-1	NP0A-010				
C34	150	500	RCM15E151K	TCZ-150	NP0-334-151	MCB236		KR-1315	
C35	470		80X4	DD-471	831-471	UC-5347		K-1347	
C36	470		80X4	DD-471	831-471	UC-5347		K-1347	
C37	1000		80X1	DD-102	801-001	DC-521			
C38	1000		80X1	DD-102	801-001	DC-521			
C39	1000		80X1	DD-102	801-001	DC-521			
C40	5		47X562	TCZ-5	NP0A-050	ZT-555			
C41	360	500	47X568					KR-1336	
C42	.047	400	RCP10M4473M	DF-503		PT4147	IMP4-S47	3304147	
C43	.1	400	RCP10M4104M	DF-104		PT401	IMP4-P1	330401	
C44	.1	200	RCP10M2104M	DF-104		PT401	IMP2-P1	330401	
C45	1000		80X1	DD-102	801-001	DC-521	IMP6-D1	K-1210	
C46	.22	200	RCP10M2224M			PT4022	IMP2-P22	3302022	
C47	1.5		47X584	TCZ-1.5	NP0A-1R5	ZT-5515			
C48A	10000		80X6	DD3-103	811-01	DC-511			
B	10000				811-01	DC-511			
C49	100		47X604	D6-101	GP1K-101	UC-531		K-1310	
C50	5000		47X507	DD-502	811-005	DC-525		C-1250	
C51	5000		47X507	DD-502	811-005	DC-525		C-1250	
C52	330	500	47X570	D6-331	GP2K-331	UC-5333		K-1333	
C53	470	500	47X525	D6-471	GP2K-471	UC -5347		K-1347	
C54	.047	200	RCP10M2473M	DF-503		PT4147	IMP2-S47	3302147	
C55	.0047	400	RCP10M4472M	D6-472	GP2-333-472	PT6247	IMP6-D47	3306247	

PROPERTY OF
" BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA FIRESTONE PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	NOTES
C56	.0047	400	RCP10M4473M	D6-473	GP3-333-472	PT6347	IMP6-D47	3306347	
C57	5000		47X50Y	DD-502	8U-006	DC-538	IMP6-D6	C-1260	
C58A	10000								
B			??EX5	??C-20	??4004-01				
C	250								
C58	.0047	600	RCP10M4473M	D6-472	GP3-333-472	PT6347	IMP6-D47	3306347	
C60	.01	400	RCP10M4103M	D6-103	GP3-333-103	PT411	IMP4-61	330611	
C61	1000		9DX1	DD-102	8U-001	DC-531	IMP6-D1	K-1210	
C62	.047	400	RCP10M4473M	DF-503		PT1467	IMP4-D47	3306147	
C63A	2000					†DC-533	IMP6-D2	C-1230	
B	5000		♦?EX?	♦?C-100	♦4406-01	†DC-535	IMP6-D5	C-1250	
C	6000					†DC-536	IMP6-D6	C-1260	
C64	4700	500	47X543			MC2465		CR-1347	
C65	.022	300	RCP10M2233M	DF-303	8U7-03	PT4132	IMP4-S33	3304132	
C66	.047	600	RCP10M4473M	DF-503		PT1467	IMP4-D47	3306147	
C67	.033	300	RCP10M2333M	DF-303	8U7-03	PT4123	IMP4-S33	3304123	
C68	.1	600	RCP10M5104M	DF-104		PT901	IMP4-P1	330601	
C69	.047	600	RCP10M4473M	DF-503		PT1467	IMP4-D47	3306147	
C70	015	600	RCP10M6153M			PT5115	IMP4-S15	3305115	
C71	1000		9DX1	DD-102	8U1-001	DC-531	IMP6-D1	K-1210	
C72	1000		9DX1	DD-102	8U1-001	DC-531	IMP6-D1	K-1210	
C73	.01	400	RCP10M4103M	DF-103	GP3-333-103	PT411	IMP4-61	330611	
C74	270	500	RCM3GA271K	DS-271	GP2K-271	MC341		K-1327	
C75	.0047	600	RCP10M4473M	DF-503	GP3-333-472	PT1467	IMP6-D47	3306347	
C76	.047	200	RCP10M2473M	DF-503		PT1447	IMP2-S47	3303147	
C77	4700	500	47X543			MC2465		CR-1347	
C78	390	500	RCM3GB391J			MC3543		ER-1339	
C79	.1	400	RCP10M4104M	DF-104		PT401	IMP4-P1	330401	
C80	330	500	47X570					ER-1333	
C81	.047	400	RCP10M4473M	DF-503		PT1467	IMP4-S47	3306147	
C82	.1	400	RCP10M4104M	DF-104		PT401	IMP4-P1	330401	
C83	.047	400	RCP10M4473M	DF-503		PT1467	IMP4-D47	3306147	
C84	.15	400	RCP10M4154M			PT4015	IMP4-P15	3304115	
C85	500	30000	47X500	TV3-503	413	RV-20035A			
C86	10000		47X515	DD-103	8U-001	DC-511	IMP6-61	330611	
C87	10000		47X515	DD-103	8U-001	DC-511	IMP6-61	330611	

† Items C58A, C58B, C58C, R54A and R54B are combined in one unit.
When replacing items separately C58B and C58C should total 250MMF.
♦ Items C63A, C63B, C63C, R75A, R75B, and R75C are combined in one unit.

CONTROLS

ITEM No.	RATING RESIST. ANCE	RATING WATTS	REPLACEMENT DATA FIRESTONE PART No.	IRC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1000Ω	½	B76X21	*QJ-638	RTV-503	F1-4	UV15L	Contrast - Panel
B	1Meg	½			R3-59	UR16-T254	UR16-T254	Volume tapped at 250KΩ - Rear
C	Switch				XB-37	XB-37	XB-37	Attach to R1B
R2A	50KΩ	½	B40X381-C	Q11-133	A47-50K-S	AB-31	U-35	Horiz. Hold
B	Shaft		Not Req.	NQ	AK-4	Not Req.	Not Req.	Attach to R2A
R3A	1.5Meg	½	B40X384-X	Q11-138	A47-1.5Meg-S	AB-75	U-185	Tone
B	Shaft		Not Req.	NQ	AS-3/16	AK-4	Not Req.	Attach to R3A
R4A	500KΩ	½	B40X333-A	Q11-132	A47-500K-S	AB-59	U-50	Brightness
B	Shaft		Not Req.	Not Req.	AS-3/16	AK-8	Not Req.	Attach to R4A
R5A	1.5Meg	½	B40X384-X	Q11-138	A47-1.5Meg-S	AB-75	U-185	Vert. Hold
B	Shaft		Not Req.	NQ	AS-3/16	AK-4	Not Req.	Attach to R5A
R7A	7.5Meg	½	B40X370A	Q11-143	A47-7.5Meg-S	AB-89	U-83	Sync Stability
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-4	Not Req.	Attach to R7A
R7A	6000Ω	½	B40X375	Q11-116	A47-10K-S	AB-14	SU-30	Vert. Linearity
B	Shaft		Not Req.	NQ	FKS-1/4	AK-1	Not Req.	Attach to R7A
R8A	2.5Meg	½	B40X368A	Q11-139	A47-2.5Meg-S	AB-83	SU-565	Height
B	Shaft		Not Req.	NQ	FKS-1/4	AK-4	Not Req.	Attach to R8A
R9A	3.5Meg	½	B40X369A	Q11-139	A47-3.5Meg-S	AB-85	SU-563	AGC
B	Shaft		Not Req.	NQ	FKS-1/4	AK-4	Not Req.	Attach to R9A

* CONCENTRIKIT EQUIVALENT: KIT K-4, BASE ELEMENTS & SHAFTS: BL-109 & PS-218 (PANEL)
BL3-157X & BL6-313 (REAR)
76-2 SWITCH

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA FIRESTONE PART No.	IRC PART No.	NOTES
R10	47KΩ	½		BTS-47K	
R11	22KΩ	½		BTS-22K	
R12	330K	½		BTS-330K	
R13	1500Ω	½		BTA-1500	
R14	470KΩ	½		BTS-470K	
R15	100KΩ	½		BTS-100K	
R16	100KΩ	½		BTS-100K	
R17	100KΩ	½		BTS-100K	
R18	8200Ω	½		BTS-8200	
R19	6800Ω	½		BTS-6800	
R20	10KΩ	½		BTS-10K	
R21	3300Ω	½		BTA-3300	
R22	3300Ω 5%	½		BTS-3300 5%	
R23	4.7Ω 5%	2	B68470	BTS-47 5%	
R24	470Ω	½	B68471	BTS-470	
R25	1000Ω	½	B68103	BTS-1000	
R26	39KΩ 5%	½	B83393	BTS-39K 5%	
R27	47Ω 5%	½	B83470	BTS-47 5%	
R28	470Ω	½	B68471	BTS-470	
R29	150Ω	½	B68151	BTS-150	
R30	39KΩ 5%	½	B83393	BTS-39K 5%	
R31	180Ω	½	B68181	BTS-180	
R32	1500Ω	½	B84152	BTS-1500	
R33	150Ω	½	B68151	BTS-150	
R34	39000 5%	½	B83392	BTS-3900 5%	
R35	5600Ω	1	C84562	BTA-5600	
R36	1500Ω	½	B84152	BTS-1500	
R37	33KΩ	½	B84333	BTS-33K	
R38	1Meg	½	B84J25	BTS-1Meg	
R39	68Ω	½	B84680	BTS-68	
R40	3000Ω 5%	2	D83302	BTS-3000 5%	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA FIRESTONE PART No.	IRC PART No.	NOTES
R41	3000Ω 5%	½	D83303	BTS-3000 5%	
R42	100KΩ	½	B84304	BTS-100K	
R43	1Meg	½	B84305	BTS-1Meg	
R44	22KΩ	½	B84223	BTS-22K	
R45	100KΩ	½	B85104	BTS-100K	
R46	47KΩ	½	B85473	BTS-47K	
R47	47KΩ	½	B84473	BTS-47K	
R48	470KΩ	½	B84474	BTS-470K	
R49	2.7Meg	½	B84275	BTS-2.7Meg	
R50	330KΩ	½	B83334	BTS-330K	
R51	100KΩ	½	B84104	BTS-100K	
R52	100Ω	½	B84101	BTS-100	
R53	1000Ω	½	B85103	BTS-1000	
R54	56KΩ	½	B84563	BTS-56K	
R55	33KΩ	½	B84333	BTS-33K	
R56	1000Ω	½	B85103	BTS-1000	
R57	33KΩ	½	B84333	BTS-33K	
R58	370Ω	½	B84371	BTS-370	
R59	68KΩ	½	B85683	BTS-68K	
R60	10KΩ 5%	½	B83103	BTS-10K 5%	
R61	10KΩ 5%	½	B83103	BTS-10K 5%	
R62	68KΩ	½	B84683	BTS-68K	
R63	10Meg	½	B85106	BTS-10Meg	
R64A	800KΩ	2		BTS-470K	
B	800KΩ	½	†?EX5	BTS-470K	
R65	330Ω	1	C84331	BTA-330	
R66	1000Ω	2	D84103	BTS-1000	
R67	47KΩ	½	B84473	BTS-47K	
R68	10KΩ	½	B84103	BTS-10K	
R69	270KΩ	½	B84274	BTS-270K	
R70	68KΩ	½	B84683	BTS-68K	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA FIRESTONE PART No.	IRC PART No.	NOTES
R71	L.5Meg	½	B84J54	BTS-L.5Meg	
R72	820KΩ	½	B84824	BTS-820K	
R73	3300Ω 5%	½	B83333	BTS-3300 5%	
R74	3300Ω 5%	½	B83332	BTS-3300 5%	
R75A	22KΩ	½		BTS-22K	
B	8200Ω	½	♦?6X7	BTS-8200	
C	6200Ω	½		BTS-6200	
R76	22KΩ	½	B84223	BTS-22K	
R77	3.3Meg 5%	½	B84335	BTS-3.3Meg 5%	
R78	22KΩ	½	B84223	BTS-22K	
R79	L.8Meg	½	B84185	BTS-L.8Meg	
R80	2.2Meg	½	B84225	BTS-2.2Meg	
R81	300KΩ 5%	½	PT4323	BTS-300K 5%	
R82	8200Ω	½	B84823	BTS-8200	
R83	2.2Meg	½	B84225	BTS-2.2Meg	
R84	82Ω	½	B84821	BTS-82Ω	
R85	2200Ω	½	B84222	BTS-2200	
R86	560Ω	½	B84561	BTS-560	
R87	100KΩ	½	B84104	BTS-100K	
R88	4.7Meg	½	B85475	BTS-4.7Meg	
R89	100KΩ	½	B84104	BTS-100K	
R90	37KΩ	½	B84373	BTS-37K	

† Items R84A, R84B, C58A, C58B and C58C are combined in one unit.
♦ Items R75A, R75B, R75C, C63A, C63B and C63C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA FIRESTONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC	6VAC	5VAC	53X339A	P-8333①				P9718 ②	
	⑤ 1.7A	250ADC	③ 3A							
	SEC. 3	SEC. 4	SEC. 5							
	2.5VAC									
	④ 3.3A									

① Taps small 6.3 volt winding.
② Taps low voltage taps on HV secondary, also low ampere 6.3 volt winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA FIRESTONE PART No.	Halldorson PART No.	Merit PART No	RCA TYPE No.	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T2	Vert. Osc. Trans.	54X10	B6703	A-3003	309T1 ①	V405	A-8125	24A87 ①	A-97X
T3	Horiz. Output Trans.	54X360	F3411 & RF800④①	RVT-9 & MWC-1④1	X110*	A-8137 & WC-5④1	FLY-24 & WC-20④①	T-35 & WC-12④①
T4	Vert. Output Trans.	51X168	21606 ①	A-3039 ①	226T1 ①	V312 ①	A-8141 ①	26854 ①	A-104X ①
T5A	Yoke-Horiz. (15.5MΩ	AA3234-1	DF503 ②	MDF-72③	21D52 ②	Y70F14②	DY-9A ②	Y-4 ②	T-17 ②
B	Vert. (46MΩ)								
T6	Horiz.Lin.Coil (1.2-6.6MΩ)	54X360	RF800③④①	MWC-6③	213R1 201R15 201R4④	WC-8 201R4 ④	WC-23 WC-4④	WC-15 ⑤	WC-12 ⑤
T7	Width Coil (.1-.6MΩ)	AA2183							

① Drill new mounting hole(s).
② Use original yoke damping network.
③ Enlarge mounting hole.
④ Connect to terms #3 & #4.
⑤ Connect to coded blue and green terms.
⑥ Drill new mounting hole or use original bracket, slider and core.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
6	9	9	10	13	7	9	10
				Jumper			
5	7	7	8	10 & 11	4	7	8
4	5	5	7	6	7	5	7
3	See Note ①	See Note ①	See Note ⑥	4	See Note ⑥	See Note ②	See Note ⑥
2	3	3	NC	2	3	3	NC
1	L	1	3	1			3
A	RF800 Term #3	MWC-1 Orange Term	3	9	WC-5 Orange Term	WC-20 Term #1	2
G	RF800 Term #4	MWC-1 Black Term	1	8	WC-5 Black Term	WC-20 Term #2	1
Connect Width Coil Across	RF800 Terms #1 & #2 across	MWC-1 Terms Red & Blue across	212R1 across		WC-5 terms Red & Blue across	WC-20 Terms #3 & #4 across	WC-12 Terms Red & Blue across
2 & 1	3 & L	3 & 1	3 & 1	2 & 1	3 & L	3 & 1	3 & L
Special Notes →	③ ⑩	⑦ ⑩	⑧	⑨	⑦ ⑩	⑦ ⑩	⑦ ⑪

⑦ Connect a 47 or 56MMF capacitor from terminal #5 to open end of R107. (Original terminal #3 connection.)
⑧ Connect a 47 or 56MMF capacitor from terminal #7 to open end of R107. (Original terminal #3 connection.)
⑨ Connect a 47 or 56MMF capacitor from terminal "T" to open end of R107. (Original terminal #3 connection.)
⑩ If the picture is out of phase, reverse width coil primary or secondary.
⑪ Jumper terms #9 & "T".

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA FIRESTONE PART No	Stancor PART No	Merit PART No	Triad PART No	Halldorson PART No	Thordarson PART No	NOTES
T8	5.1KΩ	3.4Ω	51X166	A-3877	A-2930	S-3X	Z1107	24S81	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP	REPLACEMENT DATA FIRESTONE PART No	VIKING PART No	QUAM PART No	NOTES
SP1	10"	PM	3.4Ω	12AS19	10210	10A31	
	8"	PM	3.4Ω	12AS18	829	8A31	
	6"	PM	5.4Ω	12AS15	626	6A31	

COILS (RF-IF)

ITEM No.	USE	DC RES PRI	DC RES SEC	REPLACEMENT DATA FIRESTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1A	Ant. Coil	0ΩCT	0Ω	9A2329-2				Channel 2
B	Ant. Coil	0ΩCT	0Ω	9A2329-3				Channel 3
C	Ant. Coil	0ΩCT	0Ω	9A2329-4				Channel 4
D	Ant. Coil	0ΩCT	0Ω	9A2329-5				Channel 5
E	Ant. Coil	0ΩCT	0Ω	9A2329-6				Channel 6
F	Ant. Coil	0ΩCT	0Ω	9A2329-7				Channel 7
G	Ant. Coil	0ΩCT	0Ω	9A2329-8				Channel 8
H	Ant. Coil	0ΩCT	0Ω	9A2329-9				Channel 9
I	Ant. Coil	0ΩCT	0Ω	9A2329-10				Channel 10
J	Ant. Coil	0ΩCT	0Ω	9A2329-11				Channel 11
K	Ant. Coil	0ΩCT	0Ω	9A2329-12				Channel 12
L	Ant. Coil	0ΩCT	0Ω	9A2329-13				Channel 13
L2	Neut. Coil	0Ω		31D-727				
L3A	RF, Mixer Grid & Osc. Coils	0Ω	0Ω	9A2330-2				Channel 2
B	RF, Mixer Grid & Osc. Coils	0Ω	0Ω	9A2330-3				Channel 3
C	RF, Mixer Grid & Osc. Coils	0Ω	0Ω	9A2330-4				Channel 4
D	RF, Mixer Grid & Osc. Coils	[illegible]	0Ω	9A2330-5				Channel 5
E	RF, Mixer Grid & Osc. Coils	0Ω	0Ω	9A2330-6				[illegible] 6
F	RF, Mixer Grid & Osc. Coils	[illegible]	0Ω	9A2330-7				Channel 7
H	RF, Mixer Grid & Osc. Coils	0Ω	0Ω	9A2330-8				Channel 8
M	RF, Mixer Grid & Osc. Coils	0Ω	0Ω	9A2330-9				[illegible] 9
I	RF, Mixer Grid & Osc. Coils	0Ω	0Ω	9A2330-10				Channel 10
J	RF, Mixer Grid & Osc. Coils	0Ω	0Ω	9A2330-11				Channel 11
M	RF, Mixer Grid & Osc. Coils	0Ω	0Ω	9A2330-12				Channel 12
L	RF, Mixer Grid & Osc. Coils	[illegible]	0Ω	9A2330-13				Channel 13
L4	Fil. Choke	0Ω		34A-704				
L5	Conv. Plate	.1Ω		31K-109				
L6	I.F Trap	.1Ω		9A2320				
L7	1st Video IF	.1Ω		9A2316				
L8	2nd Video IF	.2Ω	.2Ω	9A2317				
L9	Fil. Choke	0Ω	0Ω	9A2033	18-1022	TV-138	6218 4606	Includes 47, 39MC trap
L10	3rd Video IF	.2Ω	.2Ω	9A2318		TV-139*	6333*	
L11	Parasitic Suppressor	0Ω		9A2322				1 turn wire on 20Ω resistor
L12	Fil. Choke	0Ω	0Ω	9A2033	18-1022		4606	
L13	Cathode Trap	0Ω	0Ω	9A2321				
L14	4th Video IF	.5Ω	.5Ω	9A2319		TV-136	6234	
L15	Series Peaking Coil	[illegible]		36A10	18-4060		6173	80 Microhenries; Wound on 22KΩ resistor
	Shunt Peaking Coil	18Ω		36A22	18-3300	TV-135	6155	390 Microhenries
L17	4.5MC Trap	.3Ω		9A2074	20-1004	TV-151	1470	
[illegible]	Series Peaking Coil	10.5Ω		36A1	18-3100	TV-131	6177	100 Microhenries; Wound on 47KΩ resistor
L19	Shunt Peaking Coil	10.5Ω		36A25	18-3100 ♦	TV-131 ♦	6177 ♦	100 Microhenries; Wound on 47KΩ resistor
L20	Series Peaking Coil	14Ω		36A13	18-4180 ♦	TV-134 ♦	6180 ♦	180 Microhenries; Wound on 22KΩ resistor
L21	Shunt Peaking Coil	14Ω		[illegible]	18-3180	TV-134	6164	180 Microhenries
L23	1st Sound IF	8.5Ω		9A2301	17-1031 ♦	TV-23 ♦	6303 ♦	
L23	2nd Sound IF	8.5Ω	2.1Ω	9A2323	17-1031	TV-23	6303	
L24	Ratio Det.	4Ω	.8ΩCT	9A2395	17-3497	TV-25	6306	Tertiary winding - .5Ω
L25	Horiz. Osc.	94Ω		[illegible]	18-1578	TV-183	6310	

* Detune trap.
♦ Parallel with 22KΩ resistor.
▲ Parallel with 470KΩ resistor.
♦ Drill mounting holes.
■ Use one winding only.

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	FIRESTONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L26	.250ADC	38.6Ω	1.06HY	52X95	C-2326 ①	C-2996 ①	C-23X①	C5037①	26C44

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			FIRESTONE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG S/B	4/10A 125V	16X147-3	16X146	313.400 (3AG-4/10A-S/B)	357091	MDL 4/10	4405

MISCELLANEOUS

ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
M2	Dial Light	7A32	#51, Bayonet
M3	Tuner	25A1119	VHF
M4	Trap	31K-225-01	VHF Ant. Input Filter
M5	Focus Magnet	2A438-2	Includes centering device
M6	Ion Trap	2A421	
B2	Trimmer Cap.	17A269	Horizontal Drive (120-400MMF)
	Knob	10A820-1	Fine tuning - Mahogany cabinet
	Knob	10A840-1	Contrast - Mahogany cabinet
	Knob	10A812-1	Channel Selector - Mahogany cabinet
	Knob	10A841-1	On-off-volume -
	Knob	10A820-2	Fine tuning - Oak cabinet
	Knob	10A840-2	Contrast - Oak cabinet
	Knob	10A812-3	Channel Selector - Oak cabinet
	Knob	10A841-2	On-off-volume - Oak cabinet
	Knob	10A826	Red- Secondary controls
	Safety Glass		Specify complete model number when ordering
	Mask		Specify complete model number when ordering

PROPERTY OF
F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TROUBLE SHOOTING AIDS (cont).

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V18, V19, V20 and V21. Check waveform W18.

If Satisfactory	If Unsatisfactory
Check T3, T5A, T6, T7, C83, C82, C84, C81, R102, R103 and other associated components.	Check L25, C77, C78, R97, R95, R94 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V19, V20, and V22. Check adjustment B2, B3 and B4. Check T3, T5A, R102, R103, R97 and other associated components.

BLOOMING

Check by substitution V19, V20, V21 and V22. Check R109, R102, R103, C84 and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V1, V2, V3, V4, V5, V6, V7, V8 and V9. Check video IF components for failure or change of value.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

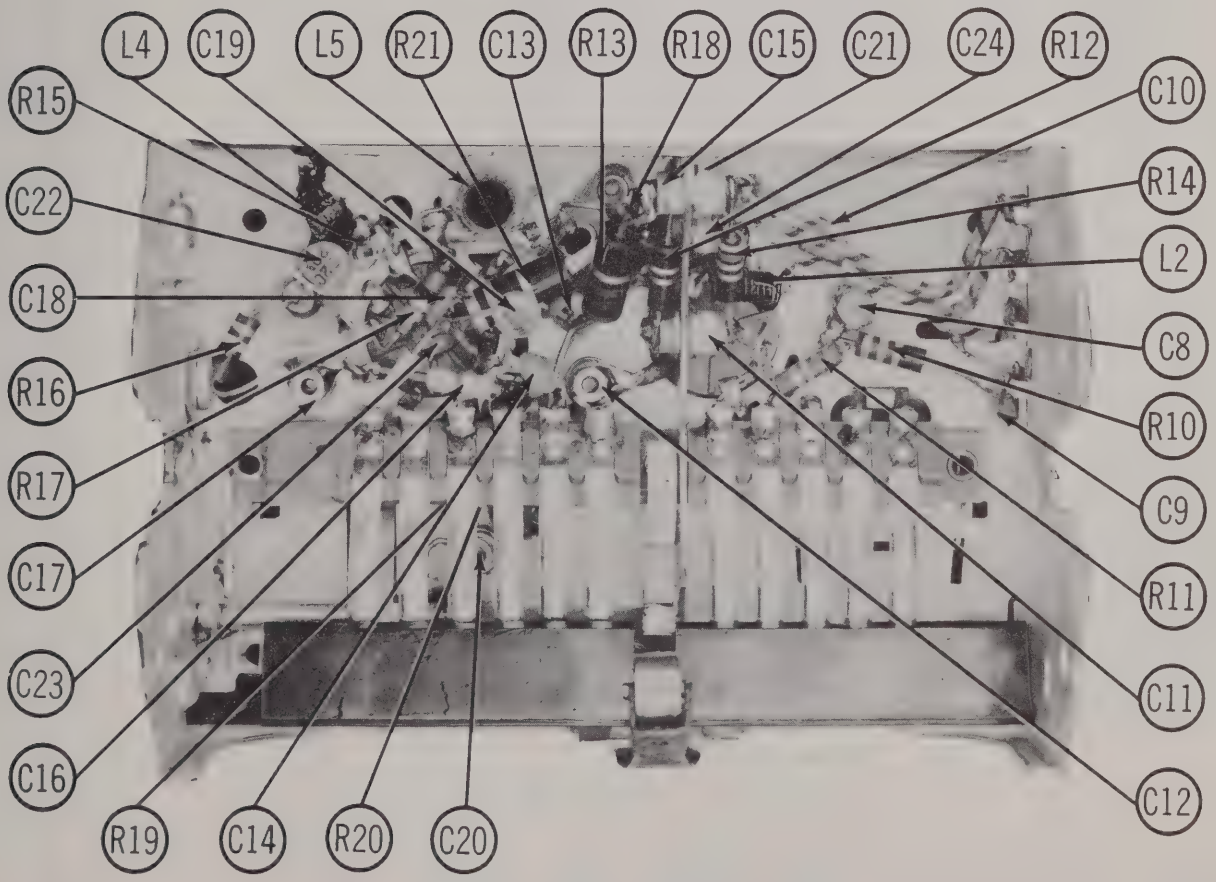
KEYSTONE EFFECT

Check T5 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



TUNER BOTTOM VIEW

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet above and slightly to the left of the channel switch.

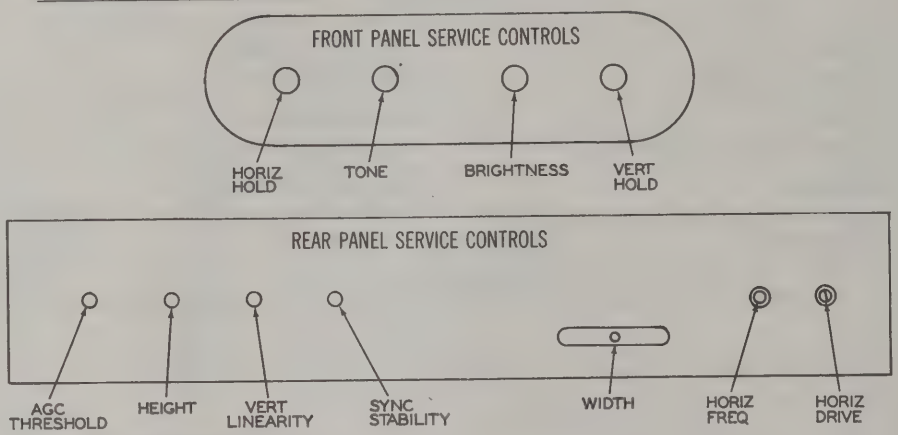
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass, remove 5 wood screws holding plastic strip at the top of the safety. Remove plastic strip and safety glass. Use extreme caution when removeing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



SPECIAL ADJUSTMENTS

AGC THRESHOLD - Turn the set on and tune in strongest station in that area. Turn the AGC Threshold Control (R9) clockwise until the picture shows signs of overloading, faded out picture and buzz in sound. Turn R9 counter clockwise from the point where overloading occurs until no sign of overloading is noted.

SYNC STABILITY CONTROL - Turn set on and tune in strongest TV station in that area. Rotate the sync stability control (R6). clockwise until bending is noted near the top of picture. Turn R6 counter clockwise until picture bending disappears.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontal hold control at the mid-range position and adjust the horizontal frequency slug (L25) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz adjust the ratio detector secondary (L24) located on top of chassis (See tube placement chart for location).

FUSES

One fuse is used for LV power supply protection.(For location see tube placement chart).

CENTERING

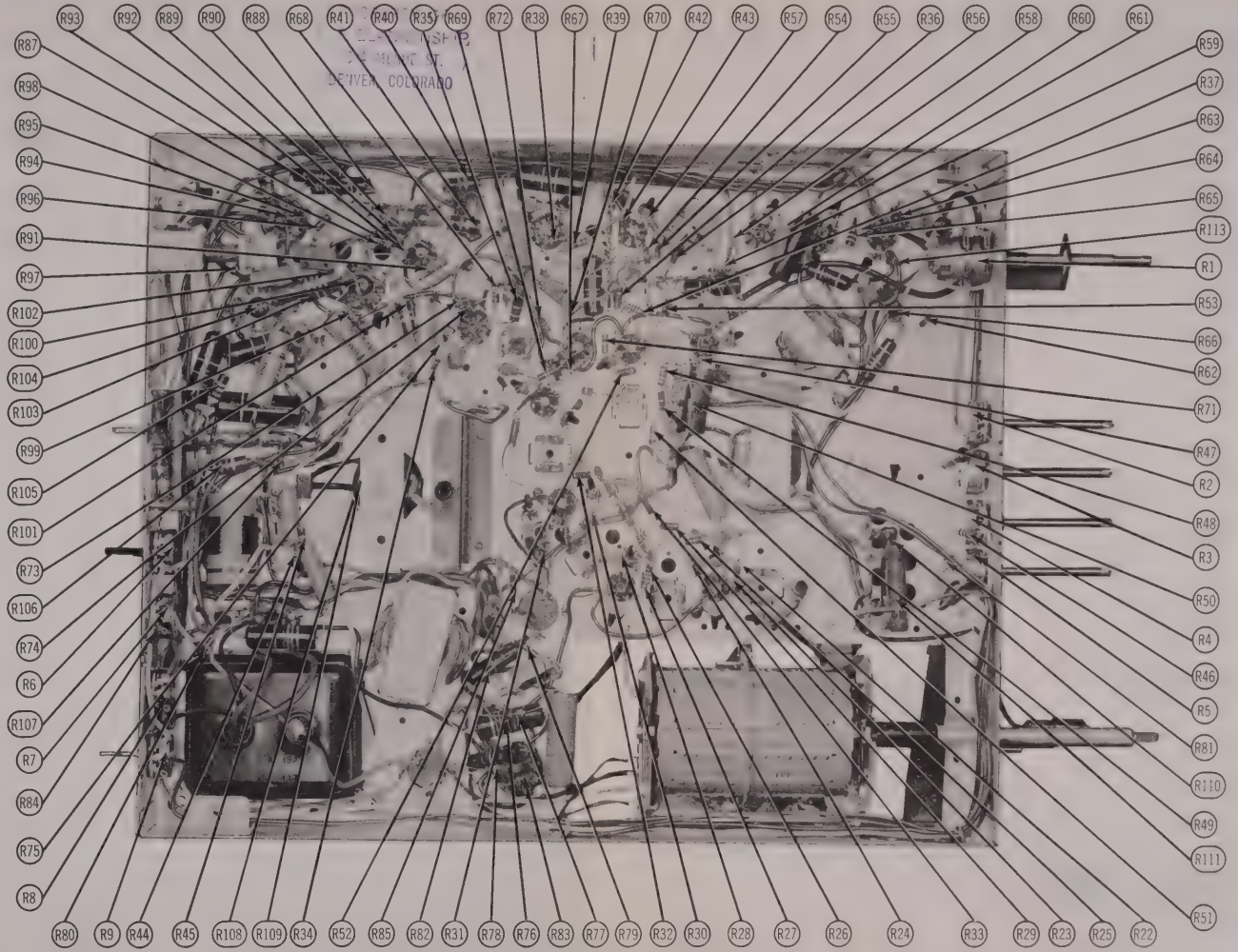
Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push-on type control knobs from front panel of cabinet.
2. Remove 4 metal screws. Remove rear cover.
3. Remove 2 metal screws from antenna leads.
4. Disconnect 2 antenna leads.
5. Remove 4 chassis bolts. Remove chassis.
6. Remove 4 speaker nuts. Remove speaker.

PICTURE TUBE REMOVAL

1. Remove 1 metal screw from front tube mounting band.
2. Remove picture tube socket and HV lead and ion trap.
3. Remove picture tube.



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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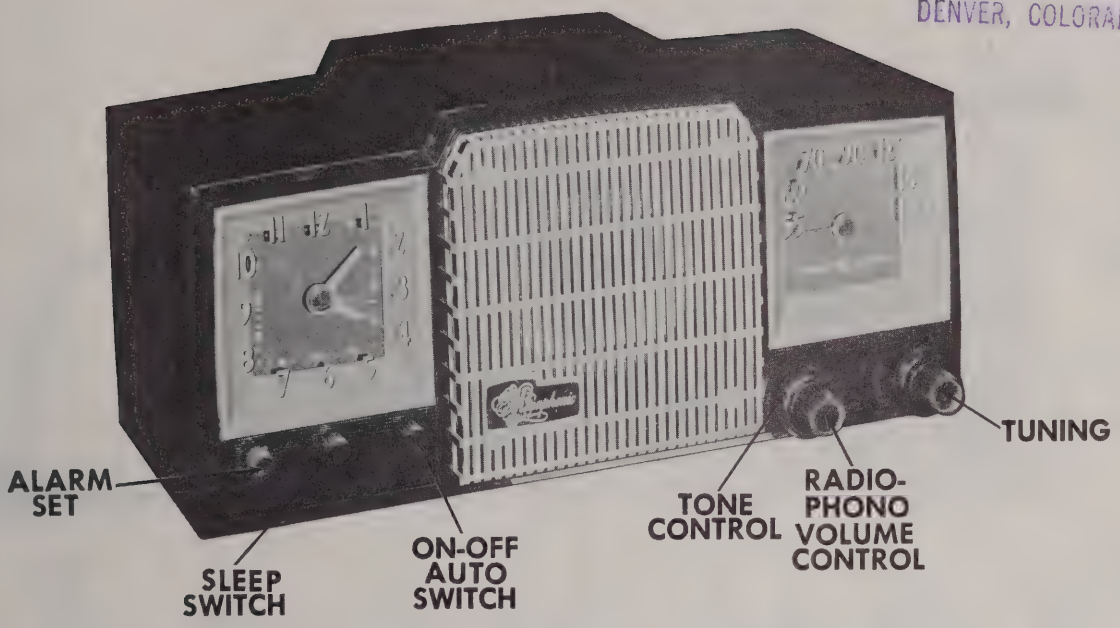
DENVER, COLORADO



GENERAL ELECTRIC
MODEL 590

TRADE NAME	General Electric Model 590
MANUFACTURER	General Electric Co., Electronics Dept., Electronics Park, Syracuse, N. Y.
TYPE SET	AC Operated AM Superheterodyne Receiver With Electric Clock
TUBES (Six)	Types 12BA6 RF Amp., 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det-AVC-AF Amp., 35C5 Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC - 60 Cycles — RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC - 1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 1 (grid) of 12BA6 (V1). Low side to B-.	455KC (400~ Mod)	Tuning gang fully open.	Across voice coil.	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	High side to pin 7 (grid) of 12BE6 (V2). Low side to B-.	"	"	"	A3, A4	"
3.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	1500KC	1500KC	"	A6, A7	"
5.		"	600KC	600KC	"	A8	Adjust for maximum output while rocking tuning gang.

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PARTS LIST AND DESCRIPTIONS

GENERAL ELECTRIC
MODEL 590

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		General Electric PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	12BA6	12BA6	7BK	
V2	Converter	12BE6	12BE6	7CH	
V3	IF Amp.	12BA6	12BA6	7BK	
V4	Det-AVC-AF Amp.	12AV6	12AV6	7BT	
V5	Audio Output	35C5	35C5	7CV	
V6	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT	General Electric PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	100	150	RCE-166				TDL-10050-150	FMT-1500	
B	50	150							
C2	100		RCW-3079	DD-101	801-101	DC3031		K-1310	
C3	2.7		RCW-3039						
C4	.05	400	UCC-045	DF-503		PT415	IMP4-S5	330415	
C5	47		RCW-3075	DD-470	831-470	DC30447		KR-1447	
C6	100		RCW-3079	DD-101	801-101	DC3031		K-1310	
C7	220		RCW-3137	DD-221	811-221	DC30322		K-1322	
C8	220		RCW-3137	DD-221	811-221	DC30322		K-1322	
C9	.02	400	RCC-129	DF-203	817-02	PT412	IMP4-S2	330412	
C10	.02	400	RCC-129	DF-203	817-02	PT412	IMP4-S2	330412	
C11A	500		RCW-3104						
B	6800								
C12	.1	200	RCC-128	DF-104		PT401	IMP4-P1	330401	
C13	.02	400	RCC-127	DF-203	817-02	PT412	IMP4-S2	330412	
C14	.047	200	RCC-126	DF-503		PT4147	IMP4-S47	3304147	
C15	.047	600	RCN-053	DF-503		PT4147	IMP4-S47	3304147	
C16	.05	400	UCC-045	DF-503		PT415	IMP4-S5	330415	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	General Electric PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	250KΩ	½	RRC-299					Tone - Panel
B	4Meg	½						Volume & Sw. Tapped at 2Meg - Rear

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	General Electric PART No.	IRC PART No.	
R2	22Ω	½	URD-009	BTS-22	
R3	22KΩ	½	URD-081	BTS-22K	
R4	100Ω	½	URD-025	BTS-100	
R5	120Ω	½	URD-027	BTS-120	Note 1
R6	33KΩ	½	URD-085	BTS-33K	
R7	330KΩ	½	URD-109	BTS-330K	
R8	2.2Meg	½	URD-129	BTS-2.2Meg	
R9	6.8Meg	½	URD-141	BTS-6.8Meg	
R10	470KΩ	½	URD-113	BTS-470K	

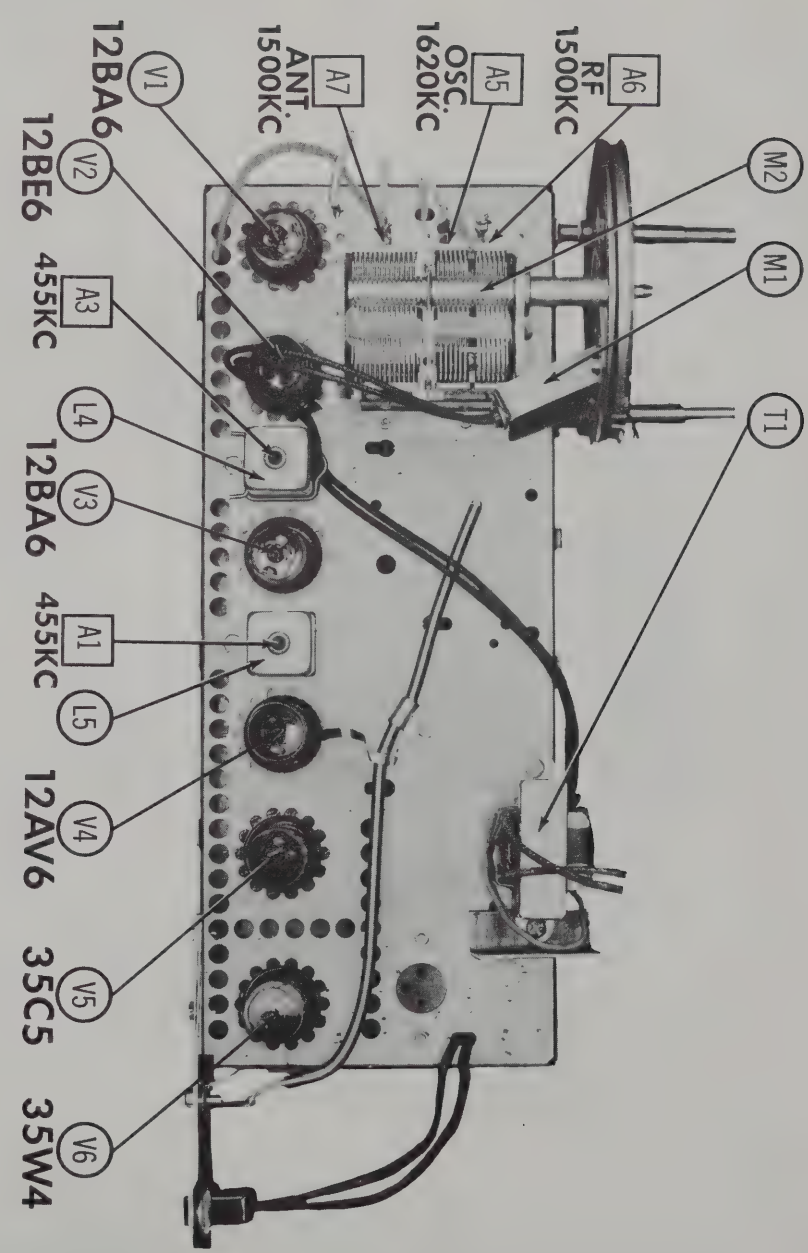
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	General Electric PART No.	IRC PART No.	
R11	470KΩ	½	URD-113	BTS-470K	
R12	150Ω	½	URD-029	BTS-150	
R13	1000Ω	2	URF-049	BTB-1000	
R14	4700Ω	½	URD-065	BTS-4700	
R15	1800Ω	½	URD-055	BTS-1800	
R16	820Ω	½	URD-047	BTS-820	
R17	15KΩ	½	URD-077	BTS-15K	
R18	18Ω	½	URD-007	BTS-18	

Note 1: Some versions use a 150Ω resistor in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	General Electric PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.4KΩ	3.4Ω	RTO-157						
		SEC. 2							
		63.4Ω RES							

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	General Electric PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3.4Ω	ROP-030	ST-803 Mod. P525-V	52A1	

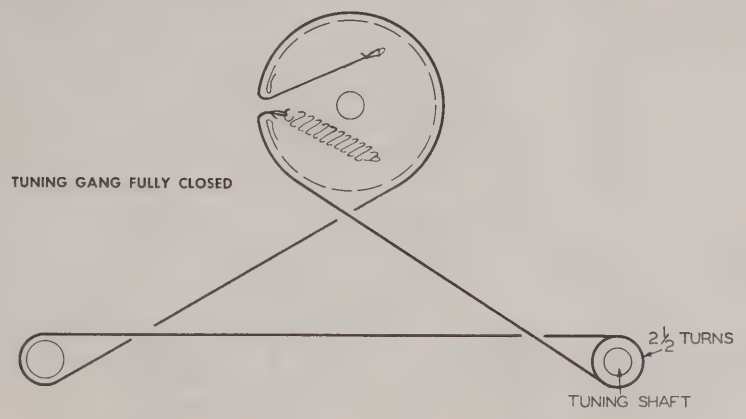
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	General Electric PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3Ω		RAB-251				Includes cabinet back.
L2	RF Coil	33Ω	10.5Ω*	RLB-034				*Tapped at 5.5Ω
L3	Osc. Coil	.5Ω	7.5Ω	RLC-126	14-1074			
L4	Input IF	13Ω	13Ω	RTL-143	16-6758■	BC-352■	12-C1■	
L5	Output IF	13Ω	13Ω	RTL-143	16-6758■	BC-353■	12-C2■	

■ Terminal connections give sufficient mounting support.

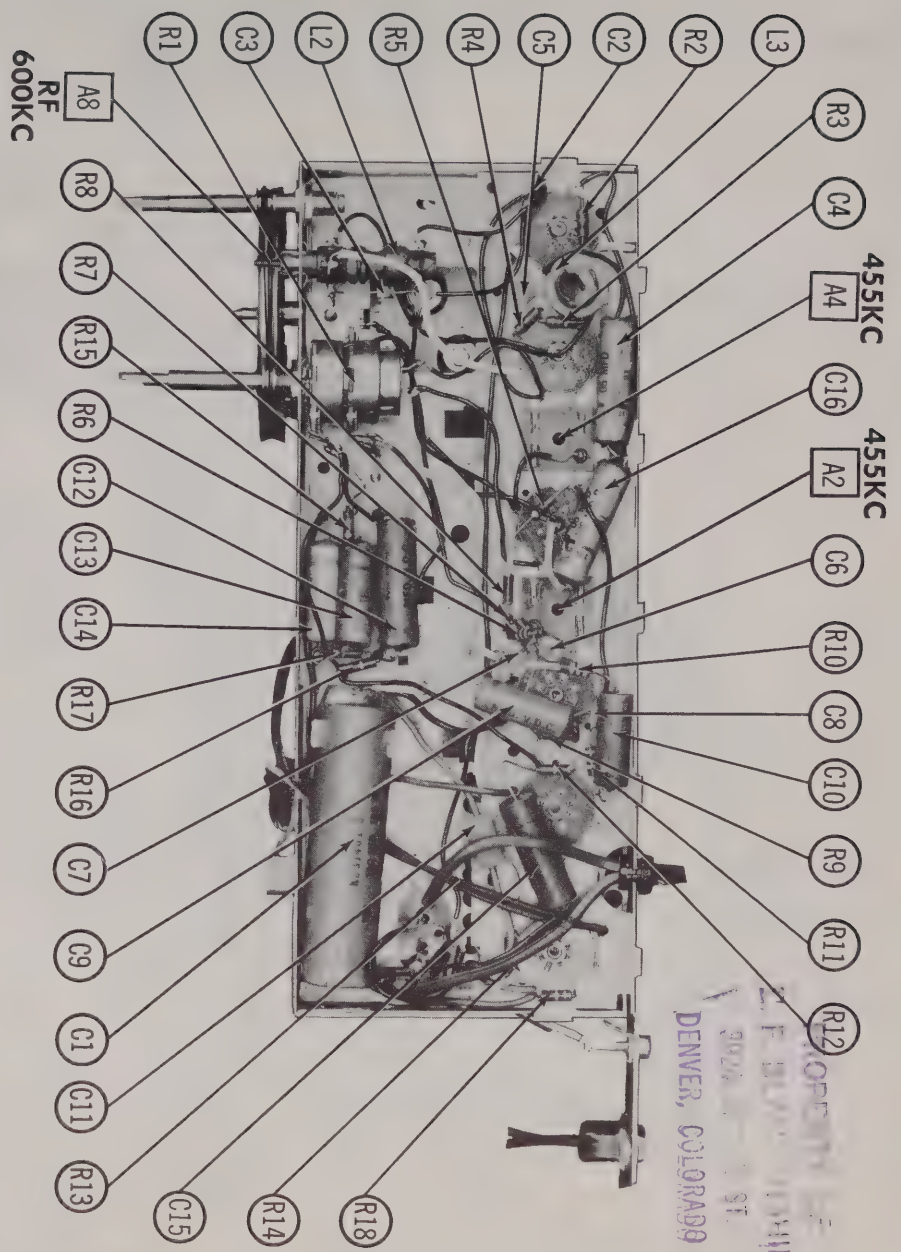
MISCELLANEOUS

ITEM No.	PART NAME	General Electric PART No.	NOTES
M1	Dial Light		#44, Bayonet
M2	Tuning Cap.	RCT-080	3 Gang (23-465MMF; 10-205MMF; 16-125MMF)
M3	Clock	RZC-041	
	Cabinet	RAU-245	
	Knob	RDK-449	Volume & Tuning
	Knob	RDK-450	Tone & Dummy
	Knob	RZK-024	Clock (3 used)
	Grille	RDG-010	
	Dial Pointer	RDP-085	
	Dial Scale	RDS-128	
	Crystal	RDW-079	Radio Dial
	Crystal	RZW-015	Clock
	Medallion	RYN-019	



DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



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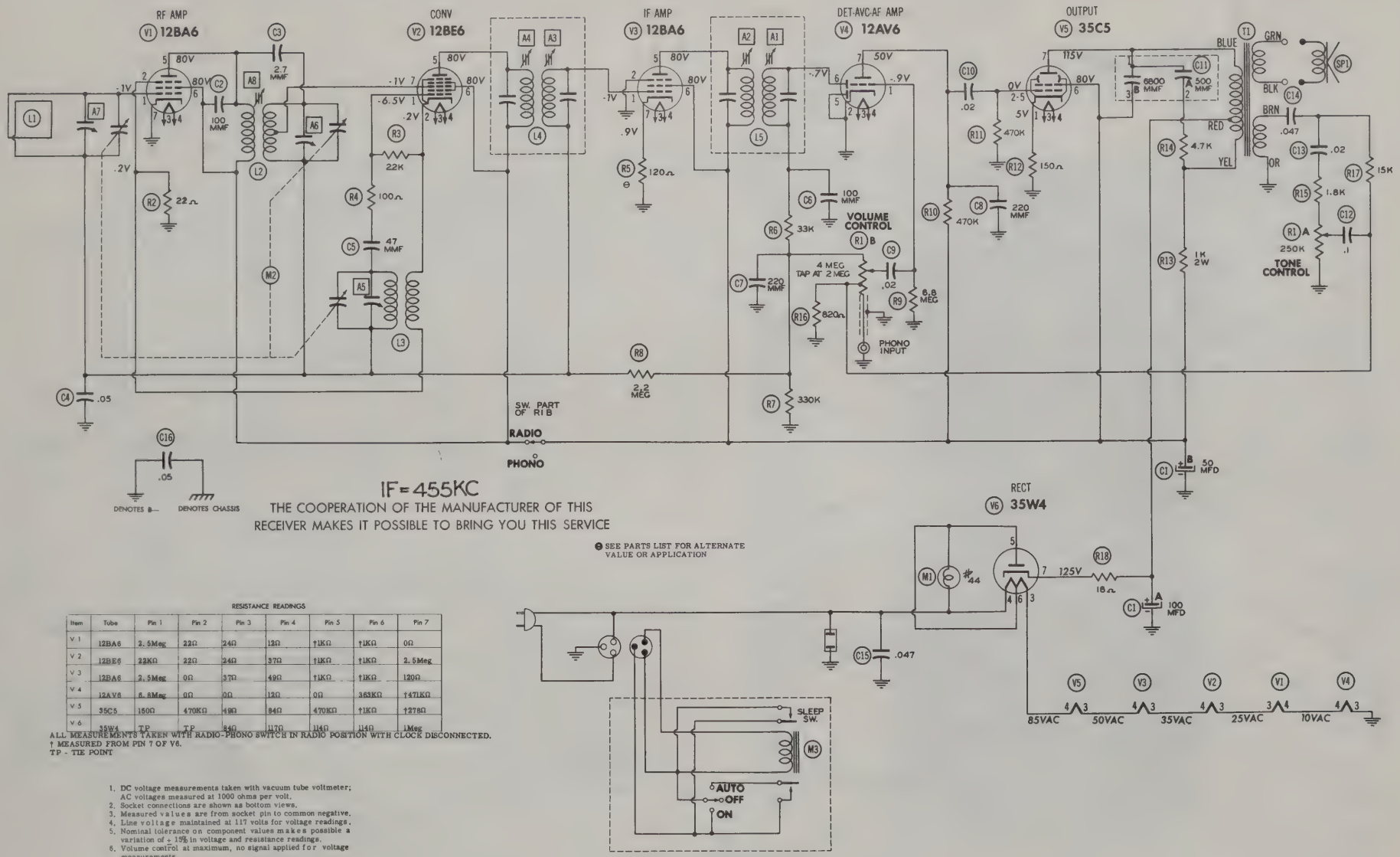
GENERAL ELECTRIC MODEL 590



IF = 455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BA6	2.5Meg	22Ω	24Ω	12Ω	↑1KΩ	↑1KΩ	0Ω
V 2	12BE6	22KΩ	22Ω	24Ω	37Ω	↑1KΩ	↑1KΩ	2.5Meg
V 3	12BA6	2.5Meg	0Ω	37Ω	49Ω	↑1KΩ	↑1KΩ	120Ω
V 4	12AV6	6.8Meg	0Ω	0Ω	12Ω	0Ω	363KΩ	↑471KΩ
V 5	35C5	150Ω	470KΩ	49Ω	84Ω	470KΩ	↑1KΩ	↑278Ω
V 6	35W4	TP	TP	84Ω	117Ω	114Ω	114Ω	1Meg

ALL MEASUREMENTS TAKEN WITH RADIO-PHONO SWITCH IN RADIO POSITION WITH CLOCK DISCONNECTED.
↑ MEASURED FROM PIN 7 OF V6.
TP - TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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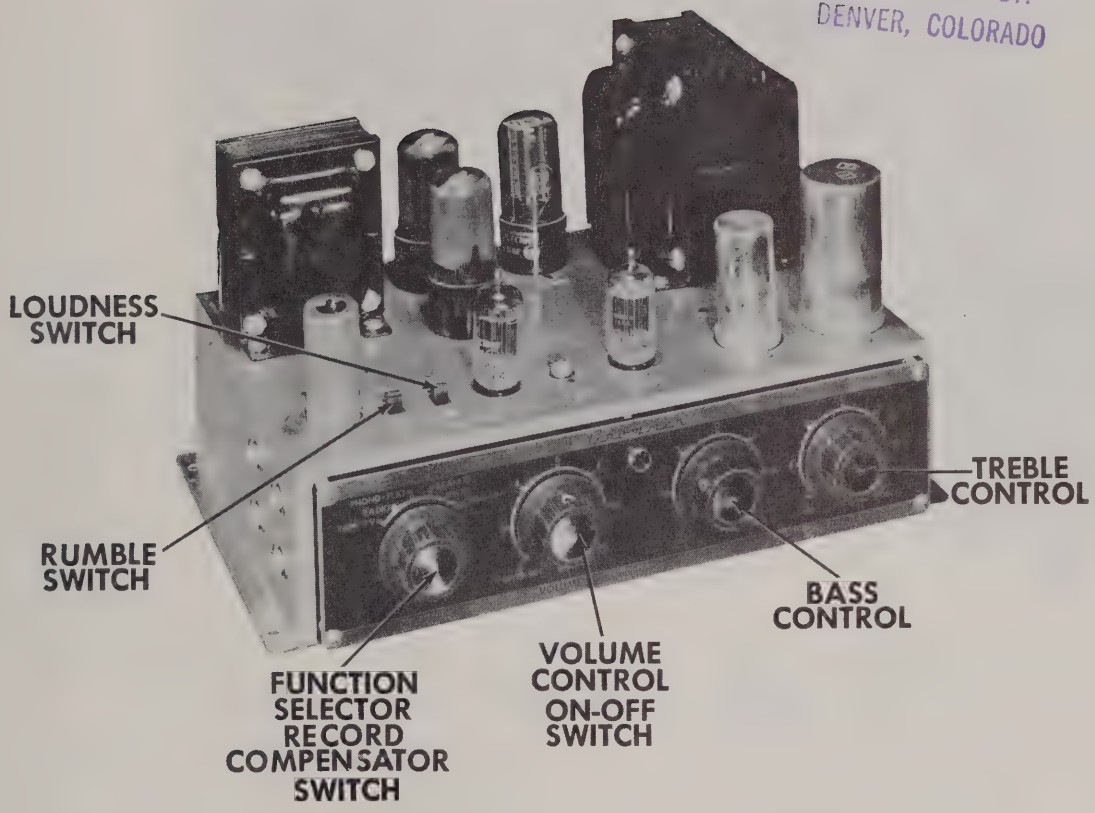

GROMMES
MODEL 55PG

TRADE NAME	Grommes Model 55PG
MANUFACTURER	Precision Electronics, 9101 King Ave., Forest Park, Ill.
TYPE SET	AC Operated 4 Channel Audio Amplifier - Equalizer
TUBES (Six)	Types 12AX7 Phono Preamp., 12AX7 AF Amp., 12AX7 AF Amp-Phase Inv., (2) 6V6GT Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING .61 Amp. @ 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

GROMMES
MODEL 55PG

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		GROMMES PART No.	STANDARD REPLACEMENT		
V1	Phono Preamp.	12AX7	12AX7	9A	
V2	AF Amp.	12AX7	12AX7	9A	
V3	AF Amp. - Phase Inverter	12AX7	12AX7	9A	
V4	Audio Output	6V6GT	6V6GT	7S	
V5	Audio Output	6V6GT	6V6GT	7S	
V6	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

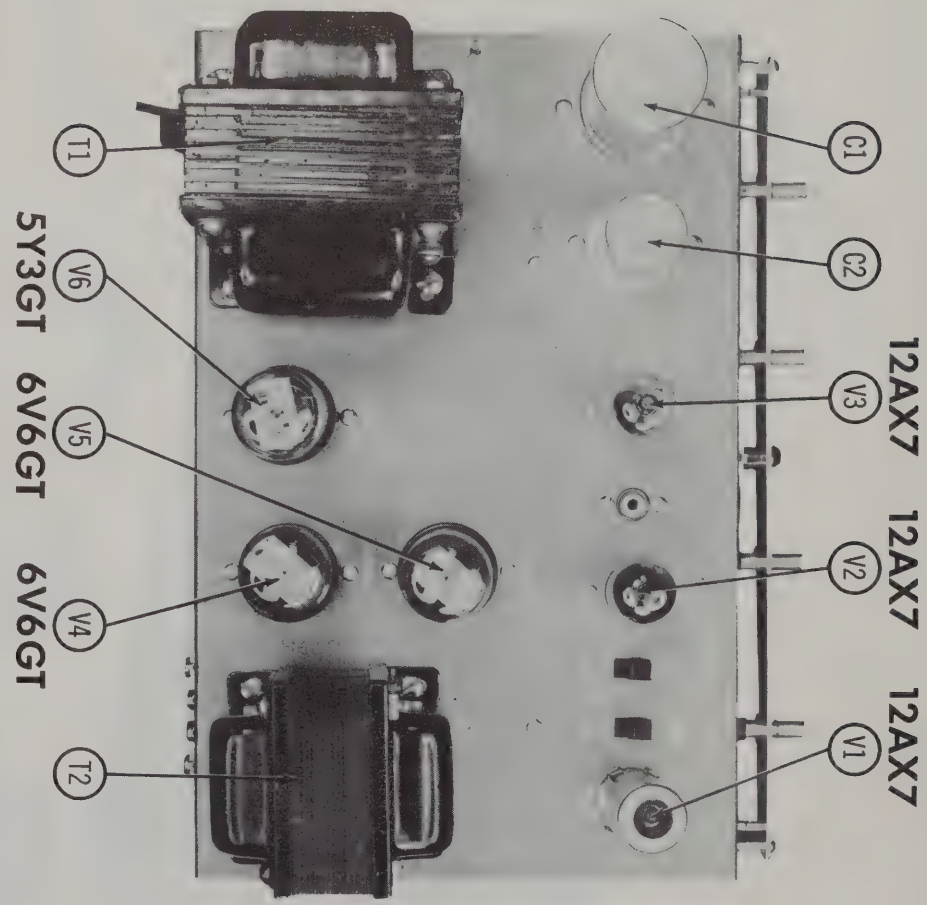
ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT	GROMMES PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	▲40	400				FP429	TM-4022	Q-380	
B	■30	350							
C	▲10	300							
C	20	25							
C2A	■10	250				FP387.1	TM-3061	D-120	
B	▲10	250						MTH-1510	
C	100	15							
C3	2000							CR-1210	
C4	1000				811-102			KR-1210	
C5	3000			DD-302	811-003			C-1230	
C6	.01	400		D6-103	811-01	PT411	IMP4-S1	330411	
C7	2000			DD-202	801-002	DC522		C-1220	
C8	.05	400		DF-503		PT415	IMP4-S5	330415	
C9	.05	400		DF-503		PT415	IMP4-S5	330415	
C10	.03	400				PT413	IMP6-S3	330613	
C11	.05	400		DF-503		PT415	IMP4-S5	330415	
C12	250	500				MCB240			
C13	3000			DD-302				C-1230	
C14	1000				811-102			KR-1210	
C15	.01	400		D6-103	811-01	PT411	IMP4-S1	330411	
C16	1000			DD-102	801-001	DC521		K-1210	
C17	.05	400		DF-503		PT415	IMP4-S5	330415	
C18	.05	400		DF-503		PT415	IMP4-S5	330415	
C19	.25	150					IMP2-P25	3302025	Note 1

Note 1: Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	GROMMES PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	W-3182	Q18-133X	AT-88	BT-63-S	UT-429	Volume tapped at 50KΩ
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A
R2A	1.5Meg	½	W-3181	Q13-139	A47-2Meg-S	B-76	U-55	Bass
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R2A
R3A	1.5Meg	½	W-3181	Q13-139	A47-2Meg-S	B-76	U-55	Treble
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R3A

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA GROMMES PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R4	22KΩ	½		BTS-22K	
R5	22KΩ	½		BTS-22K	
R6	2200Ω	½		BTS-2200	
R7	100KΩ	1		BTA-100K	
R8	100KΩ	½		BTS-100K	
R9	820KΩ	½		BTS-820K	Note 1
R10	1Meg	½		BTS-1Meg	
R11	3.3Meg	½		BTS-3.3Meg	
R12	100KΩ	1		BTA-100K	
R13	4.7Meg	½		BTS-4.7Meg	
R14	22KΩ	½		BTS-22K	
R15	1000Ω	½		BTS-1000	
R16	100KΩ	½		BTS-100K	
R17	100KΩ	½		BTS-100K	
R18	220KΩ	½		BTS-220K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA GROMMES PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R19	22KΩ	½		BTS-22K	
R20	22KΩ	½		BTS-22K	
R21	100Ω	½		BTS-100	
R22	220KΩ	½		BTS-220K	
R23	47KΩ	½		BTS-47K	
R24	220KΩ	½		BTS-220K	
R25	1000Ω	½		BTS-1000	
R26	220KΩ	½		BTS-220K	
R27	300Ω	10		1 3/4A-300	
R28	270KΩ	½		BTS-270K	
R29	5600Ω	2		BTB-5600	
R30	2700Ω	½		BTS-2700	
R31	22KΩ	½		BTS-22K	
R32	47KΩ	½		BTS-47K	

Note 1: Some versions may use a 1Meg resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA GROMMES PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @ .61A	670VCT .080ADC	5VAC @ 2A	6.3VCT @ 1.7A		PC-8409①	P-3152 ①	R-11A ①	P9310 ①	24R04U ①

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA GROMMES PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T2	6.8KΩ CT	16Ω Tap @ 8Ω @ 4Ω		A-3307①②		S-31A ①	Z1012①②	22S97 ①	① Drill new mounting holes. ② Tape 500Ω tap.

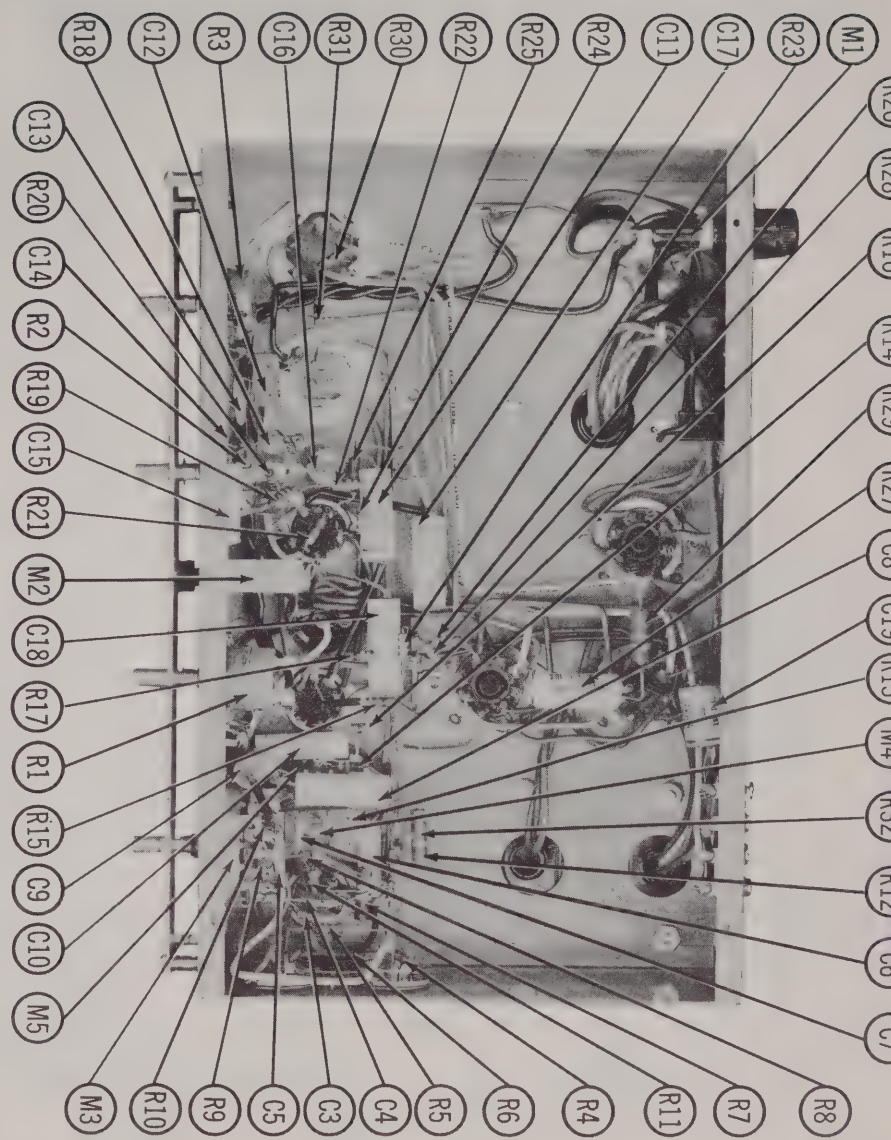
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA GROMMES PART No. FUSE	GROMMES PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	1½A 250V			31201.5 (3AG - 1½A)	342001	AGC 1½	HKP

MISCELLANEOUS

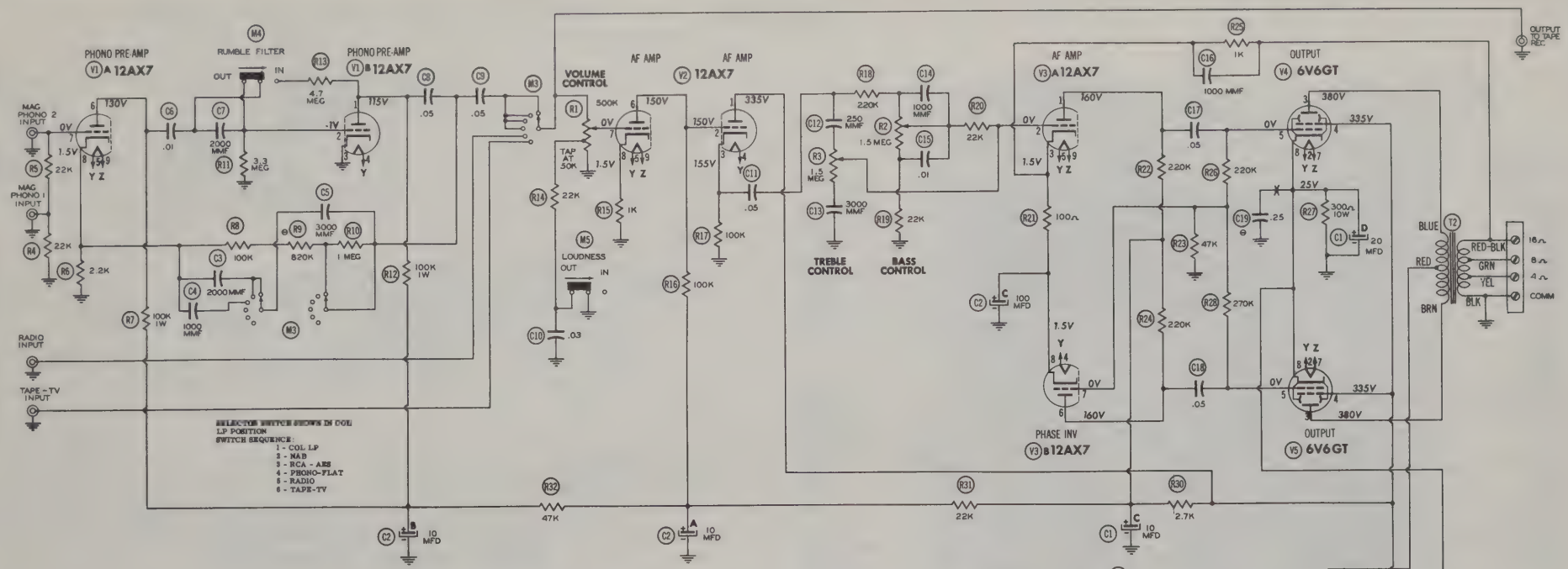
ITEM No.	PART NAME	GROMMES PART No.	NOTES
M2	Pilot Light		#51, Bayonet
M3	Switch		Selector & Compensator (3 Pole - 6 Position)
M4	Switch		Rumble (SPDT - Slide Type)
M5	Switch		Loudness (SPDT - Slide Type)

CHASSIS—BOTTOM VIEW



SET 279 FOLDER 7

GROMMES MODEL 55PG



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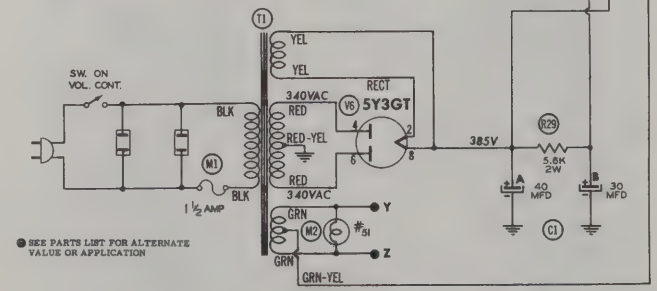

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	†172KΩ	3.3Meg	0Ω	300Ω	300Ω	†172KΩ	44KΩ	2.2KΩ	300Ω
V 2	12AX7	†5.6KΩ	†123KΩ	100KΩ	300Ω	300Ω	†123KΩ	20Ω	1KΩ	300Ω
V 3	12AX7	†223KΩ	45KΩ	1KΩ	300Ω	300Ω	†223KΩ	47KΩ	1.1KΩ	300Ω
V 4	6V6GT	TP	300Ω	†110Ω	†5.6KΩ	267KΩ	NC	300Ω	300Ω	
V 5	6V6GT	NC	300Ω	†110Ω	†5.6KΩ	317KΩ	TP	300Ω	300Ω	
V 6	5Y3GT	NC	1.1Meg	NC	145Ω	NC	145Ω	NC	1.1Meg	

† MEASURED FROM PIN 2 OF V6.
NC - NO CONNECTION
TP - TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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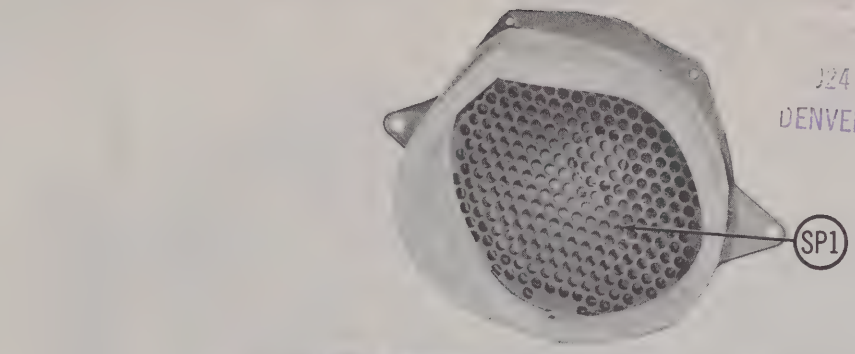
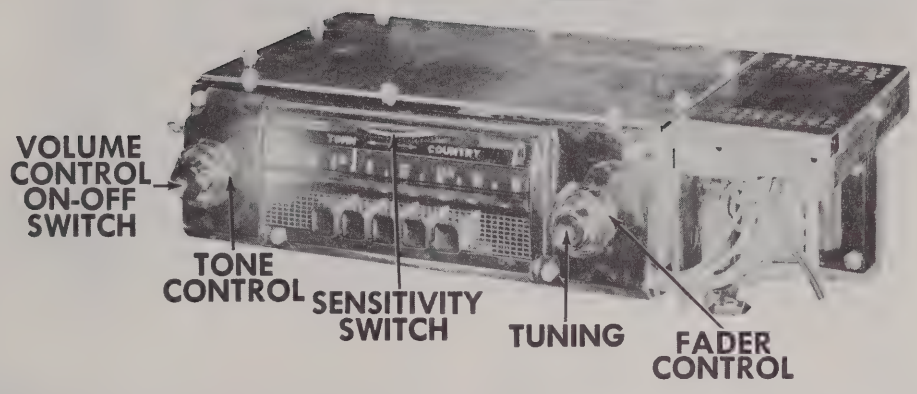
MOPAR MODELS 902
(C-5595), 903 (C-5596)





TRADE NAME	Mopar Models 902 (Philco Model C-5595), 903 (Philco Model C-5596) For 1955 Chrysler Products
MANUFACTURER	Philco Corp., Tioga & "C" Sts., Philadelphia, Pa.
TYPE SET	Battery Operated Custom Built AM Superheterodyne Automobile Receiver
TUBES (Nine)	Types 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AV6 Det.-AVC-AF Amp., 6CS6 Phase Det., 12AU7 Phase Inv., -Trigger Amp., (2) 6AQ5 Output, 6X4 Rectifier (12 Volt Equivalent Tubes Used in Model 903)
POWER SUPPLY	6 (or) 12 Volt Storage Battery — RATING 5.6 Amp. @ 6.3V DC (or) 2.8 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540KC-1605KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Allow 15 minute warm-up period for receiver and equipment.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Tone control oto mid-position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	265MC (400~Mod)	See Note 1	Across voice coil	A1, A2, A3	Adjust for maximum deflection.
2.	"	"	"	"	"	A4	Adjust for maximum deflection. See note 2.
3.	See Fig.1	Thru dummy to antenna receptacle.	1605KC	"	"	A5	Adjust for maximum deflection.
4.	"	"	1400KC	1400KC	"	A6, A7	Adjust for maximum deflection.

Note 1. Set tuner so that latch pawl just touches trigger ear on frame. See photographs.
Note 2. Secondary of 2nd. IF (A4) is a critical adjustment. Rock A4 to be sure the indicator dip is due to resonance at 265KC and not due to mistuning on either side of 265KC.

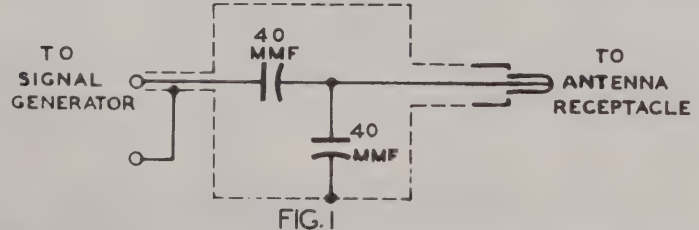


FIG. 1

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	6BA6	6BA6	7BK	12BA6 used in 12V Model 903
V2	Converter	6BE6	6BE6	7CH	12BE6 used in 12V Model 903
V3	IF Amplifier	6BA6	6BA6	7BK	12BA6 used in 12V Model 903
V4	Det.-AVC-AF Amp.	6AV6	6AV6	7BT	12AV6 used in 12V Model 903
V5	Phase Det.	6CS6	6CS6	7CH	12CS6 used in 12V Model 903
V6	Phase Inv.-Trigger	12AU7	12AU7	9A	
V7	Audio Output	6AQ5	6AQ5	7BZ	12AQ5 used in 12V Model 903
V8	Audio Output	6AQ5	6AQ5	7BZ	12AQ5 used in 12V Model 903
V9	Rectifier	6X4	6X4	5BS	12AX4 used in 12V Model 903

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

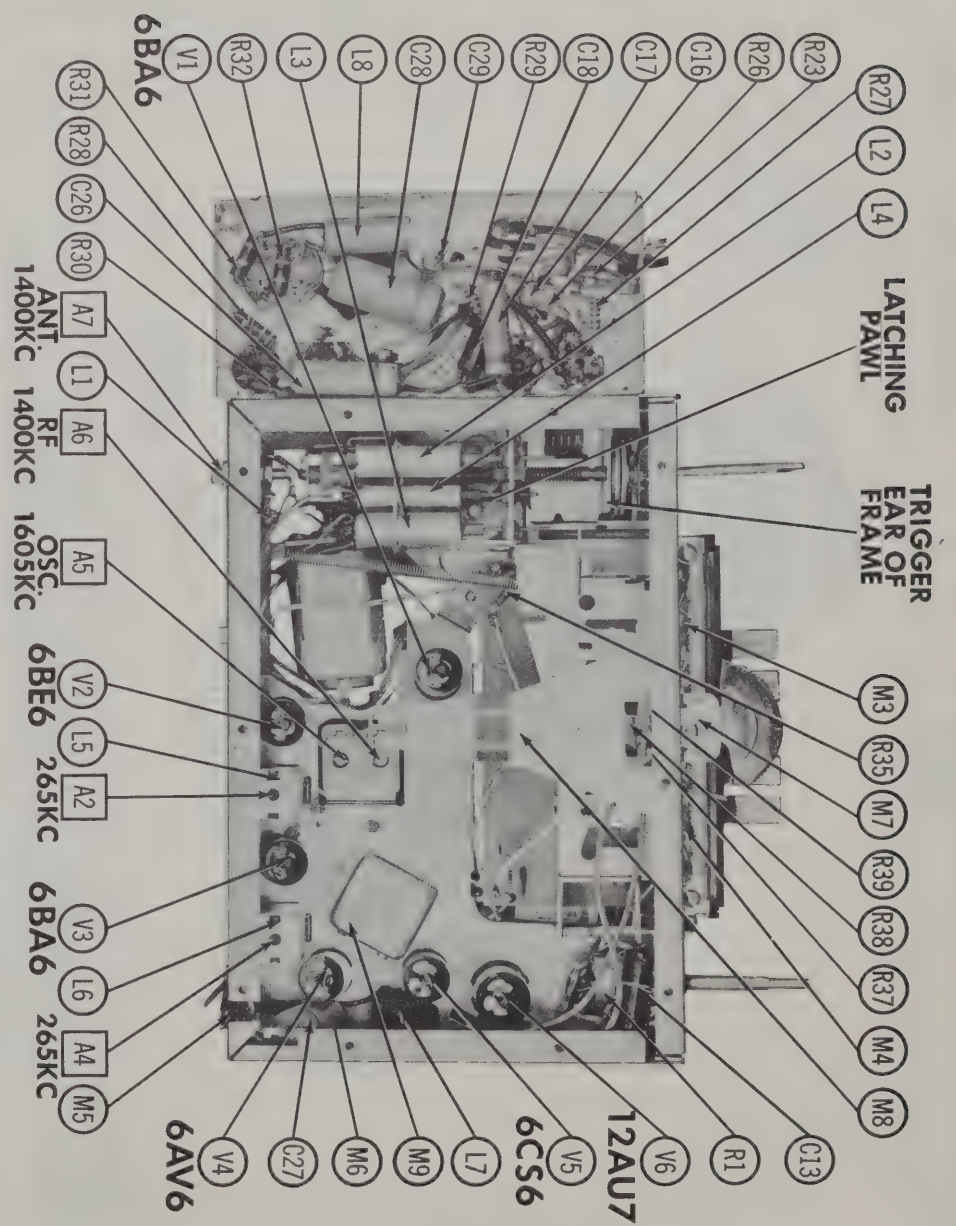
ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PHILCO PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	■20	350	61-0086A			FP333.6	TM-3028	T-465	
B	▲10	350							
C	20	25							
C2	.047	200	30-4650-45	DF-503		PT4147	IMP2-S47	3302147	
C3	.047	200	30-4650-45	DF-503		PT4147	IMP2-S47	3302147	
C4	.1	200	30-4650-47	DF-104		PT401	IMP2-P1	330201	
C5	20		62-022409001	D6-200	GP1K-200	UC-542		K-1420	
C6	15		62-015409011	D6-150	GP1K-150	UC-5415		K-1415	
C7	250		30-1224-129						
C8	.047	200	30-4650-45	DF-503		PT4147	IMP2-S47	3302147	
C9	4.7		30-1221-5	TCZ-4.7	NP0A-050	ZT-555		KR-1550	
C10	5000		30-1238-1	DD-502	811-005	DC-525		C-1250	
C11	220		32-122001001	D6-221	GP2K-221	UC-5322		K-1322	
C12	10000		30-1238-2	DD-103	811-01	DC-511			
C13	.1	200	30-4650-47	DF-104		PT401	IMP2-P1	330201	
C14	.25	100	30-4650-49			PT4025	85LPT2-P25	3302025	
C15	5000		30-1238-1	DD-502	811-005	DC-525	IMP6-D5	C-1250	
C16	.01	600	30-4650-58	D6-103	GP2-333-103	PT611	IMP6-S1	330611	
C17	.01	600	30-4650-58	D6-103	GP2-333-103	PT611	IMP6-S1	330611	
C18	.0068	1000	30-4650-91				CT10-D68		
C19	100		62-110009001	D6-101	GP1K-101	UC-531		K-1310	
C20	100		62-110009001	D6-101	GP1K-101	UC-531		K-1310	
C21	20		62-020309011	D6-200	GP1K-200	UC-542		K-1420	
C22	.047	200	30-4650-45	DF-503		PT4147	IMP2-S47	3302147	
C23	10000		30-1238-2	DD-103	811-01	DC-511			
C24	.033	400	30-4650-44			PT6133	IMP6-S3	3306133	
C25	.047	400	30-4650-45	DF-503		PT4147	IMP4-S47	3304147	
C26	.022	1000	30-4650-128			PT16122			
C27	.5	100	61-0183			RF480	85LPT2-P5	330205	
C28	.5	100	61-0183			RF480	85LPT2-P5	330205	
C29	330		62-133001001	D6-331	GP2K-331	UC-5333		K-1333	
C30	.047	400	30-4650-45	DF-503		PT4147	IMP4-S47	3304147	Note 1
C31	330			D6-331	GP2K-331	UC-5333			Note 1

Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	*		33-5557-16			F1-83	UF106L	Tone-panel
B	350KΩ					R2-35	UR354A	Volume-rear
C	Switch					KB-4	US-26	Attach to R1B
R2	25Ω	2	33-5576-1					Fader wire-wound

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PHILCO PART No.	IRC PART No.	
R3	1000Ω	1/2	66-2108340	BTS-1000	Note 1
R4	10KΩ	1/2	66-3108340	BTS-10K	
R5	22KΩ	1/2	66-3228340	BTS-22K	
R6	68KΩ	1/2	66-3688340	BTS-68K	
R7	330Ω	1/2	66-1338340	BTS-330	
R8	27KΩ	1	66-3274340	BTA-27K	
R9	22KΩ	1/2	66-3228340	BTS-22K	
R10	1Meg	1/2	66-5108340	BTS-1Meg	
R11	1Meg	1/2	66-5108340	BTS-1Meg	
R12	1Meg	1/2	66-5108340	BTS-1Meg	
R13	10Meg	1/2	66-6108340	BTS-10Meg	
R14	220KΩ	1/2	66-4228340	BTS-220K	
R15	180Ω	1/2	66-1188340	BTS-180	
R16	1Meg	1/2	66-5108340	BTS-1Meg	
R17	3300Ω	1/2	66-2338340	BTS-3300	
R18	1Meg	1/2	66-5108340	BTS-1Meg	
R19	68KΩ	1/2	66-3688340	BTS-68K	
R20	100KΩ	1/2	66-4108340	BTS-100K	
R21	1Meg	1/2	66-5108340	BTS-1Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PHILCO PART No.	IRC PART No.	
R22	100KΩ	1/2	66-4108340	BTS-100K	
R23	2200Ω	1/2	66-2228340	BTS-2200	
R24	10Meg	1/2	66-6108340	BTS-10Meg	
R25	220KΩ	1/2	66-4228340	BTS-220K	
R26	220KΩ	1/2	66-4228340	BTS-220K	
R27	470KΩ	1/2	66-4478340	BTS-470K	
R28	330Ω	1	66-1334340	BTA-330	
R29	470KΩ	1/2	66-4478340	BTS-470K	
R30	1000Ω	1	66-2104340	BTA-1000	
R31	68Ω	1/2	66-0684340		Note 2
R32	68Ω	1/2	66-0684340		Note 2
R33	1Meg	1/2	66-5108340	BTS-1Meg	
R34	680Ω	1/2	66-1688340	BTS-680	
R35	15KΩ	1/2	66-3158340	BTS-15K	
R36	68Ω	1	66-0684340		
R37	820Ω	1/2	66-1828340	BTS-820	
R38	820Ω	1/2	66-1828340	BTS-820	
R39	5600Ω	1/2	66-2568340	BTS-560Ω	

Note 1. Some versions use a 330Ω resistor in this application.
Note 2. Model 903 uses a 22Ω resistor in this application.

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	PHILCO PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	6.3VCT @3.58	380VCT .045A			32-8314-6 32-8592-1 ①					

① 12V vibrator trans. used in Model 903.

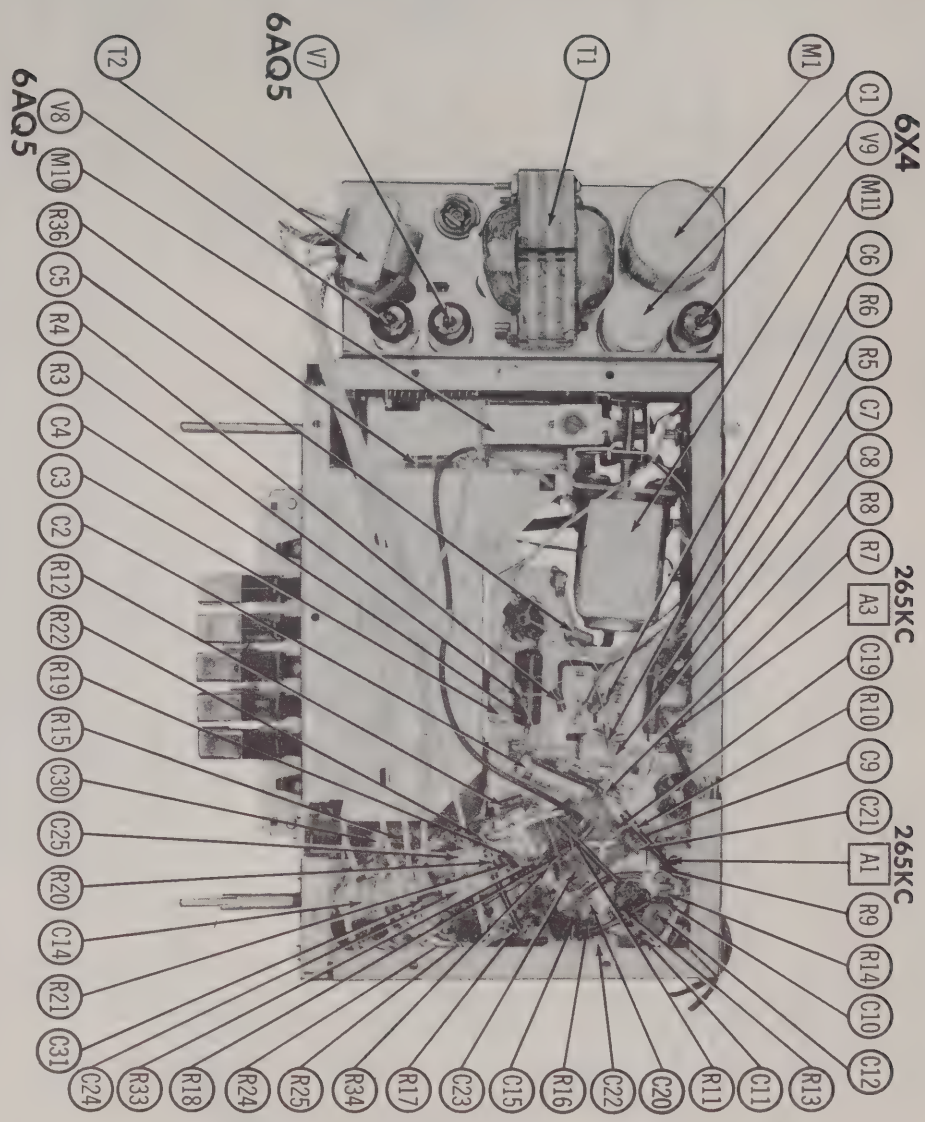
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	PHILCO PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	6.2KΩ CT	3.1Ω	32-8316-10	A-3850	A-2900	S-51X	Z1004	22S47	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	PHILCO PART No.	JENSEN PART No.	QUAM PART No.	
SP1	7"	PM	3.1Ω	36-1632-7	ST-806 Mod. P7-U	7A31	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Loading Coil	4Ω		32-4422-24	19-1004			5.6 Microhenries, IRC part #CL-1
L2	Ant. Coil	14Ω		76-9238				Part of complete assy.
L3	RF Coil	14Ω		76-9238				Part of complete assy.
L4	Osc. Coil	.7Ω	4.2Ω	76-9238				Part of complete assy.
L5	Input IF	36Ω	36Ω	32-4160-17A	16-6752	BC-350	12-H1	
L6	Output IF	41Ω	41Ω	32-4240-12A	16-6754	BC-354	12-H6	
L7	Fil. Choke	0Ω		32-1374-5	19-1001		5221	1.8 Microhenries
L8	Vib. Hash Choke	0Ω		32-4170-4				64 Microhenries

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				PHILCO PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6.3V	115~	83-0035 83-0035-1 ①	5326 6326	509P G859	5326 6326	① 12V vibrator used in Model 903

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			PHILCO PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A	AD-2243-4	41-3910-10	307014 (SFE-14A)	155014	SFE14	HRI

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M3A	Dial Light	34-2064	#44, Model 902
B	Dial Light	34-2397	Model 903
M4A	Dial Light	34-2064	Model 902, #44
B	Dial Light	34-2397	Model 903
M5	Spark Plate	30-1235-2	300 Microhenries ("A" Lead)
M6	Spark Plate	30-1254	300 Microhenries (Dial Lights)
M7	Switch	42-2040	Sensitivity (Includes knob)
M8	Switch	76-9367	Tuner switch assy. (Includes automatic start switch, start switch, and pushbutton control switching)
M9	Relay	42-4026	Search
M10A	Solenoid	42-4027	Clutch- Model 902
B	Solenoid	42-4027-1	Clutch-Model 903
M11A	Motor	41-2050	Model 902 (6V)
B	Motor	41-2050-1	Model 903 (12V)
	Trimmer Cap.	31-6522-5	Dual (4 section) Osc. & RF trimmer, also includes 200MMF IF Trap and 60MMF osc. coupling cap. (fixed capacities)
	Padder Cap.	31-6502-5	Ant. Padder
	Knob	27-4687-23	Volume and tuning
	Knob	28-10342	Tone and fader
	Dial Background	28-10320	
	Dial Scale	54-9352	
	Pushbutton Assy.	76-9288	5 used
	Cover	56-6708FA8	Pushbutton (5 used)
	Pointer Arm Assy.	76-9365	
	Push Bar	28-10343	Station Selector
	Window	54-6167	Glass

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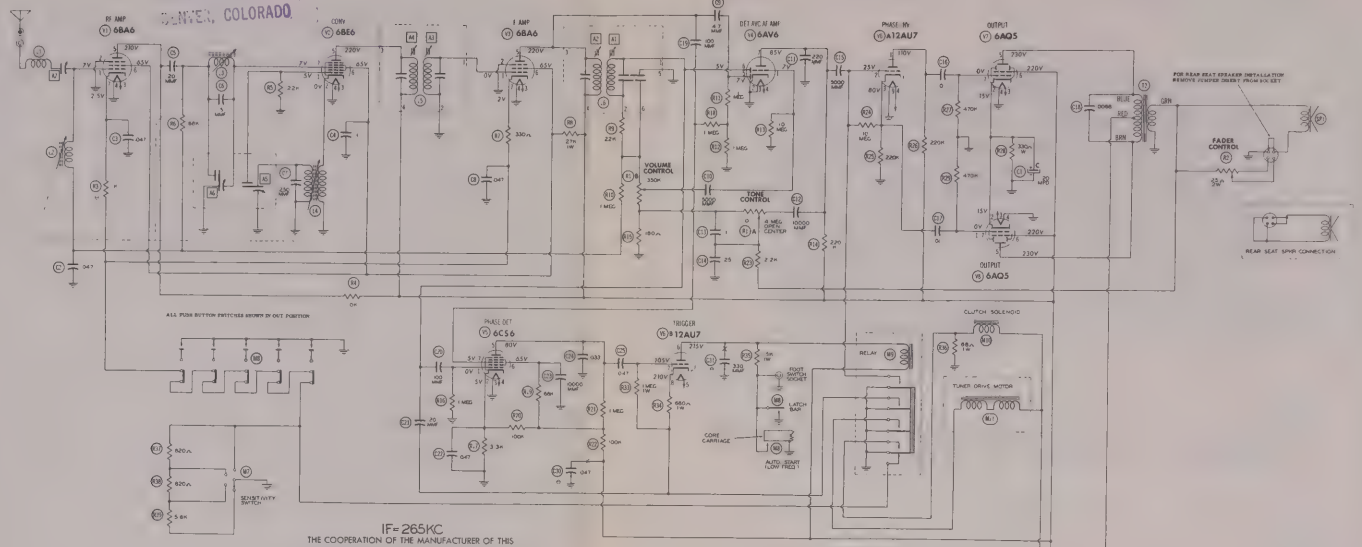

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BA6	1.3Meg	0Ω	.1Ω	0Ω	†1KΩ	†28KΩ	1000Ω		
V 2	6BE6	22KΩ	.1Ω	.1Ω	0Ω	†1KΩ	†28KΩ	1.4Meg		
V 3	6BA6	37Ω	0Ω	.1Ω	0Ω	†1KΩ	†28KΩ	330Ω		
V 4	6AV6	10Meg	0Ω	0Ω	.1Ω	2Meg	372KΩ	†321KΩ		
V 5	6CS6	1Meg	3.3KΩ	0Ω	.1Ω	†1.1Meg	†185KΩ	2Meg		
V 6	12AU7	†22KΩ	10Meg	220KΩ	.1Ω	.1Ω	†3KΩ	▲1Meg	▲880Ω	0Ω
V 7	6AQ5	470KΩ	330Ω	.1Ω	0Ω	†220Ω	†1KΩ	470KΩ		
V 8	6AQ5	470KΩ	330Ω	.1Ω	0Ω	†220Ω	†1KΩ	470KΩ		
V 9	6X4	400Ω	NC	.1Ω	0Ω	NC	400Ω	80KΩ		

† MEASURED FROM PIN 7 OF V8
▲ MEASURED WITH RELAY ARMATURE HELD DOWN

1. DC voltage measurements taken with vacuum tube voltmeter, 11 megohms measured to 1000 ohms per volt.
2. Resistor measurements are shown as ohms unless.
3. Set controls for FM reception of strong local broadcast signals.
4. Battery voltage maintained at 6.3 volts for voltage readings.
5. Readings obtained are components values which may vary a variation of ± 10% in voltage and resistance readings.
6. Values marked ▲ are dynamic, no signal applied for voltage measurements.

ALL VOLTAGE READINGS OF 6 VOLTS DC ARE FOR MODEL 201. THESE READINGS SHOULD BE INTERPOLATED AS 30 VOLTS DC FOR MODEL 900

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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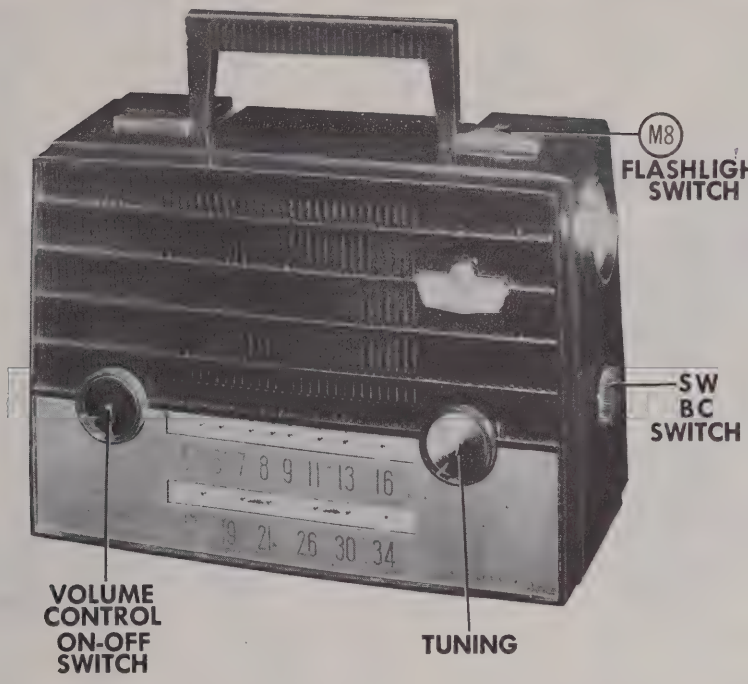

PHILCO MODEL
C-667 (Code 121)

TRADE NAME	Philco Model C-667 (Code 121)
MANUFACTURER	Philco Corp., Tioga & "C" Sts., Philadelphia, Pa.
TYPE SET	Three Power Portable 2 Band AM Superheterodyne Receiver With Self Contained Flashlight
TUBES (Five)	Types 1T4 RF Amp., 1R5 Conv., 1U4 IF Amp., 1U5 Det-AVC-AF Amp., 3V4 Output
POWER SUPPLY	110-120 Volts AC-DC (or) 9 Volts "A" Supply & 90 Volts "B" Supply In Pack Form
RATING	.12 Amp. @ 117 Volts AC (or) 50MA @ 9 Volts DC & 13MA @ 90 Volts DC
TUNING RANGE—BROADCAST	540KC - 1620KC SPECIAL SERVICES 1700KC - 3400KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use battery power if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1R5 (V2). Low side to B-.	265KC (400~ Mod)	BC	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.	Direct	Loop	1630KC	"	"	"	A5	Insert .006 shim (non-metallic) between heel of rotor and top of stator plates. Close gang enough to hold shim. Carefully remove shim to avoid disturbing gang and adjust for maximum output.
3.	"	"	580KC	"	Tune to 580KC signal.	"	A6	Adjust for maximum output. while rocking tuning gang.
4.	"	"	"	"	"	"	A7	Adjust for maximum output. This adjustment need be made only if dial tracking is off or sensitivity is low at 580KC.
5.	"	"	1500KC	"	1500KC	"	A8, A9	Adjust for maximum output. Repeat steps 3 & 5.
6.	"	"	3200KC	SS	Tune to 3200KC signal.	"	A10, A11	Adjust for maximum output.
7.	"	"	1800KC	"	Tune to 1800KC signal.	"	A12	"

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		PHILCO PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	1T4	1T4	6AR	
V2	Converter	1R5	1R5	7AT	
V3	IF Amp.	1U4	1U4	6AR	
V4	Det-AVC-AF Amp.	1U5	1U5	6BW	
V5	Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT	PHILCO PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	▬60	150	30-2568-58			FP410. 7	TM-4119		
B	▲10	150							
C	■60	150							
C	60	25							
C2	100		62-110009001	D6-101	GP1K-101	UC-531		K-1310	
C3	.05	200	30-4650-45	DF-503		PT415	IMP2-S5	330215	
C4	.05	200	30-4650-45	DF-503		PT415	IMP2-S5	330215	
C5	.05	200	30-4650-45	DF-503		PT415	IMP2-S5	330215	
C6	665	500	30-1220-66						
C7	1.5		30-1221-3	TCZ-1.5	NP0A-1R5	ZT-5515			
C8	47		62-047009001	D6-470	GP1K-470	UC-5447		K-1447	
C9	.1	200	30-4650-47	DF-104		PT401	IMP2-P1	330201	
C10	.1	200	30-4650-47	DF-104		PT401	IMP2-P1	330201	
C11	.05	200	30-4650-45	DF-503		PT415	IMP2-S5	330215	
C12	.003	400	30-4650-55	D6-302	GP2-333-302	PT623	IMP6-D3	330623	
C13	100		62-110009001	D6-101	GP1K-101	UC-531		K-1310	
C14A	1000			DD-102	801-001	DC-521			
B	200		30-1237	D6-201	811-201	UC-532			
C	10000			DD-103	811-01	DC-511			
D	2000			DD-202	801-002	DC-522			
C15	.004	600	30-4650-56	D6-402	GP2-333-402	PT624	IMP6-D4	330624	
C16	.047	400		DF-503		PT4147	IMP4-S47	3304147	Note 1

Note 1: Some versions use .04MFD in this application. (Part no. 30-4650-45)

CONTROLS

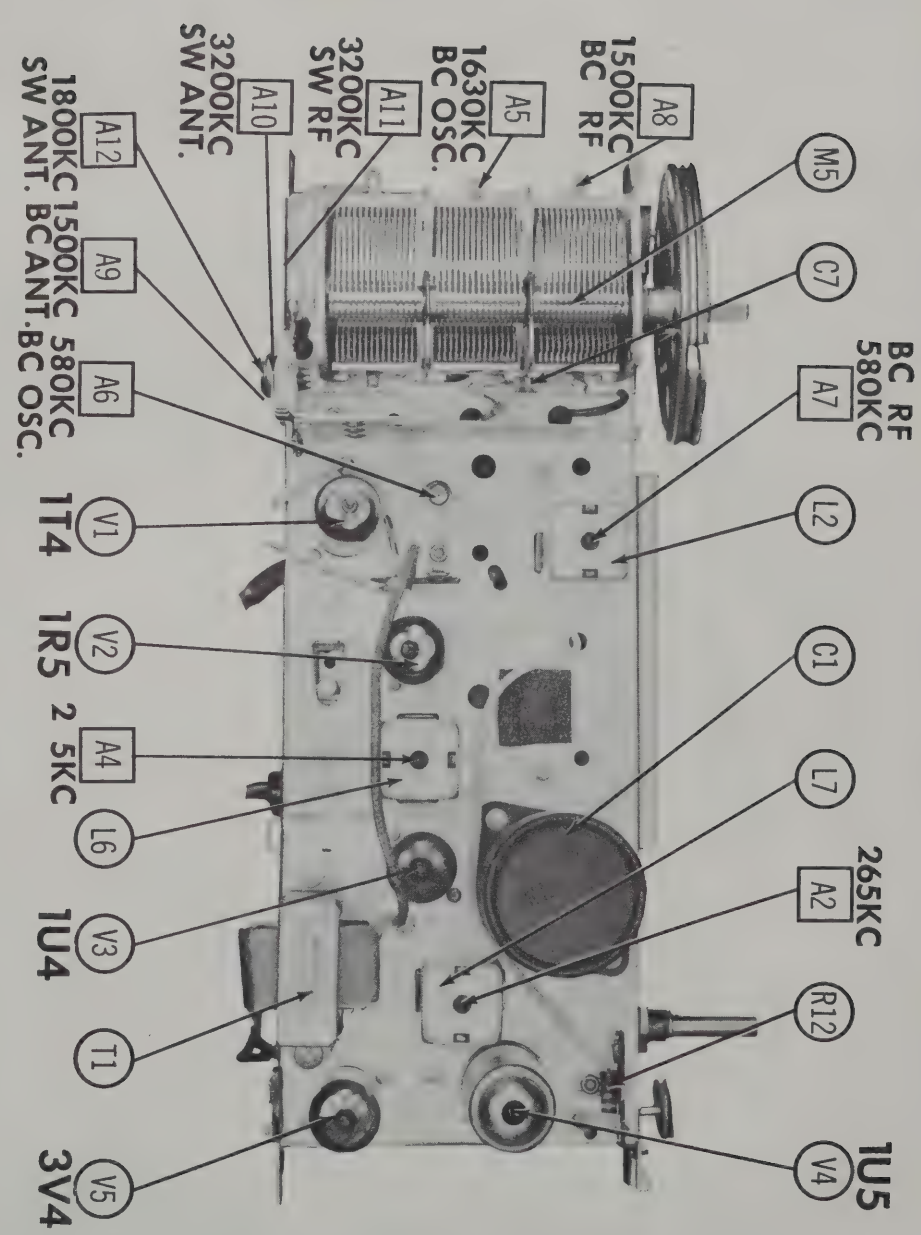
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	33-5566-11	Q13-137	A47-1Meg-Z	B-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWE-20	Not Req.	US-27	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PHILCO PART No.	IRC PART No.	
R2	2.2Meg	½	66-5228340	BTS-2.2Meg	
R3	100Ω	½	66-1108340	BTS-100	
R4	4.7Meg	½	66-5478340	BTS-4.7Meg	
R5	100KΩ	½	66-4108340	BTS-100K	
R6	1500Ω	½	66-2158340	BTS-1500	
R7	82Ω	½	66-0828340	BTS-82	
R8	220Ω	½	66-1228340	BTS-220	
R9	2200Ω	½	66-2228340	BTS-2200	
R10	15KΩ	½	66-3158340	BTS-15K	
R11	100KΩ	½	66-4108340	BTS-100K	
R12	4.7Meg	½	66-5478340	BTS-4.7Meg	
R13	4.7Meg	½	66-5478340	BTS-4.7Meg	
R14	4.7Meg	½	66-5478340	BTS-4.7Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PHILCO PART No.	IRC PART No.	
R15	4.7Meg	½	66-5478340	BTS-4.7Meg	
R16	680KΩ	½	66-4688340	BTS-680K	
R17	3.3Meg	½	66-5338340	BTS-3.3Meg	
R18	3.3Meg	½	66-5338340	BTS-3.3Meg	
R19	330Ω	½	66-1338340	BTS-330	
R20	82Ω	½	66-0828340	BTS-82	
R21	15KΩ	½	66-3153546	BTS-15K	
R22	1000Ω	½	66-2108340	BTS-1000	
R23	330Ω	½	66-1338340	BTS-330	
R24A	950Ω	7	33-3431-7		
B	950Ω				
R25	120Ω	2	33-1334-14		
R26	150KΩ	½	66-4158340	BTS-150K	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	PHILCO PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	9KΩ	3.3Ω	32-8528	A-3329	A-2927①	S-11X	Z1116 ②	24S49	① Drill one new mounting hole. ② Tape extra tap on primary.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	PHILCO PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.3Ω	36-1625	ST-105 Mod. P5-X	5A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.1Ω	.8Ω*	32-4565				*Tapped at .4Ω
L2	RF Coil	97Ω	4.8Ω	32-4399-6A				
L3	RF Shunt Coil	2.3Ω		32-4561	19-6033	TV-180	4628	
L4	Osc. Coil	2.7Ω	6.5Ω	32-4263-6	14-1074	BC-394	70-Osc. ■	
L5	Osc. Shunt Coil	6.5Ω		32-4562	19-7068		4630	
L6	Input IF	36Ω	36Ω	32-4160-16A	16-6752	BC-350	12-H1	
L7	Output IF	36Ω	36Ω	32-4240-11A	16-6754	BC-372	12-H6	

■ Leads sufficient mounting support.

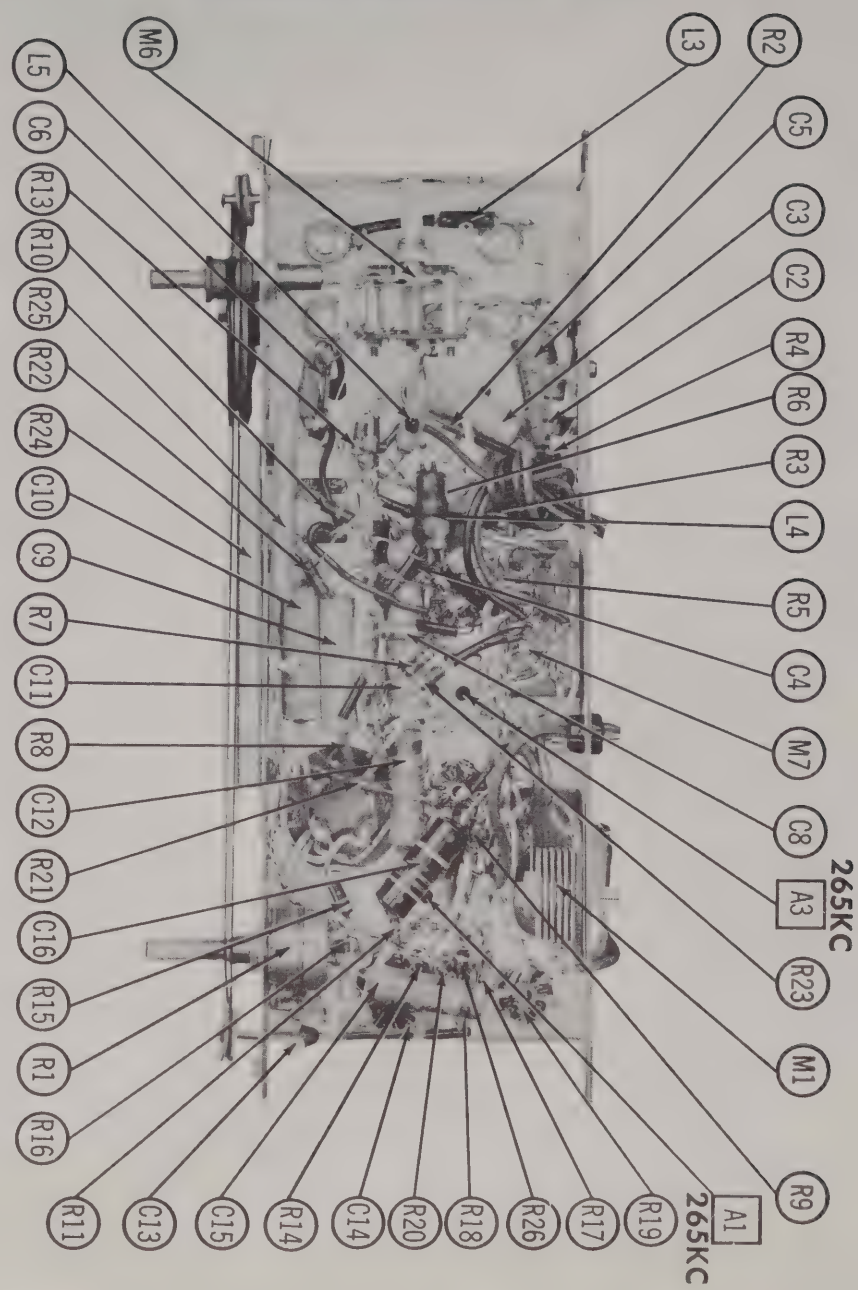
SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	PHILCO PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.065	34-8003	1003A	RS65	6S75	5M4	75	

BATTERIES

ITEM No.	VOLTAGE	PHILCO PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	9V "A" 90V "B"	P-274			756			T6Z60	
M3	3V (Flashlight)	P-912	63S			#1			Connect 2 in series.

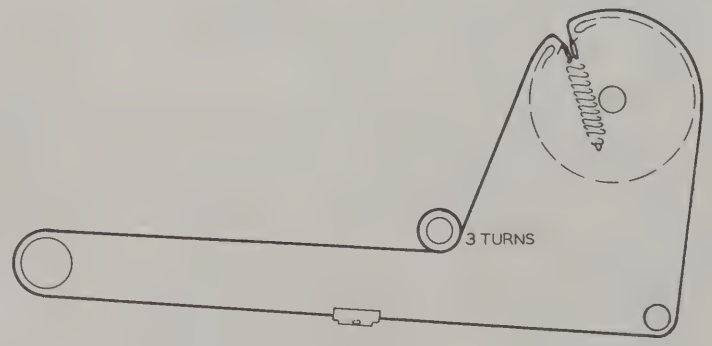
CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

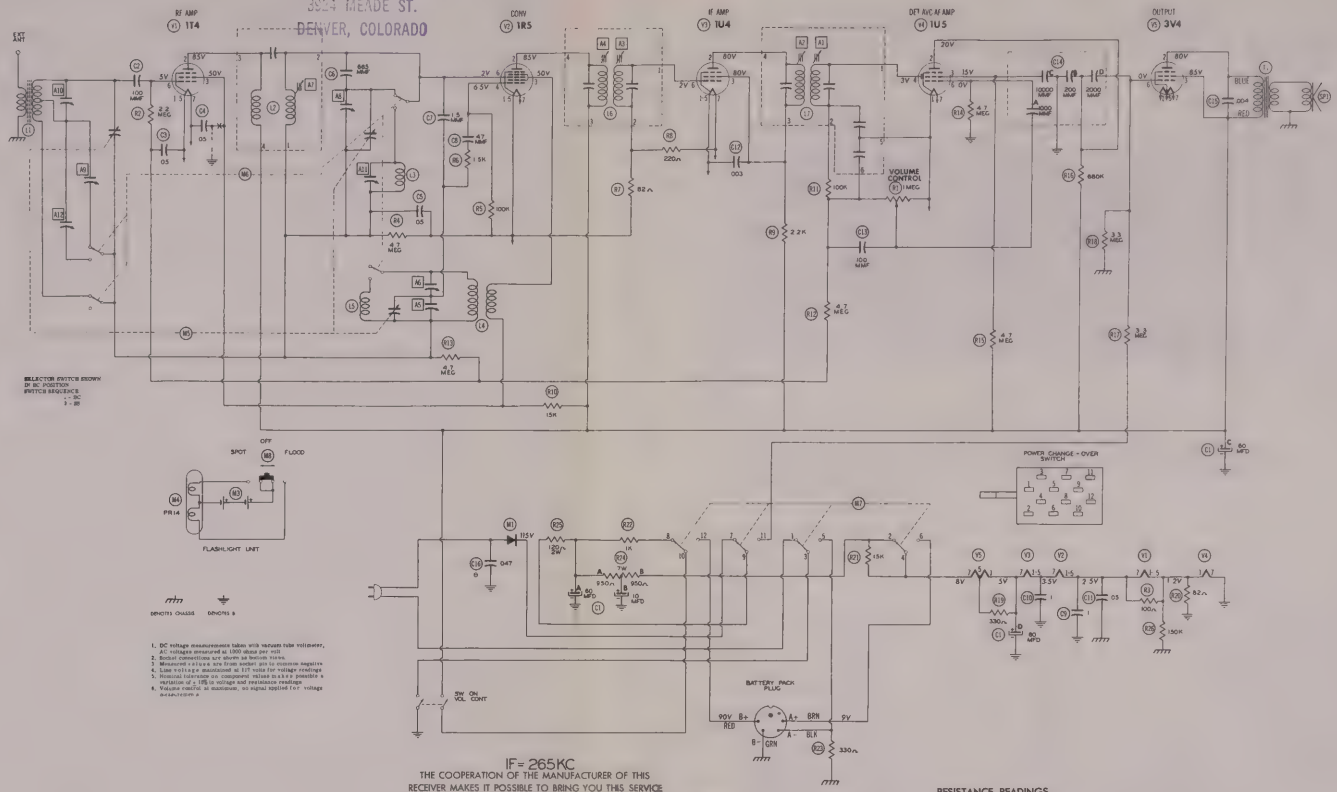
MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M4	Bulb	3463-3	Flashlight - GE Type PR14
M5	Tuning Cap.	31-2748-5	3 Gang (14-480MMF; 14-480MMF; 14-480MMF)
M6	Switch	42-1986	Band Selector - (Rotary - Wafer Type)
M7	Switch	42-1899	Power Changeover (Slide Type)
M8	Switch	42-2038	Flashlight
	Padder Cap.	31-6473-28	Broadcast & Special Services Osc. Padder (700-900MMF)
	Trimmer Cap.	31-6473-27	Special Services RF Trimmer
	Trimmer Cap.	31-6477-16	3 Section Ant. Trimmer
	Cabinet	11054-1	Maroon
	Cabinet Back	54-6130	
	Handle	54-6131	
	Knob	54-6093-2	Tuning & On-Off-Volume
	Knob	54-6016-10	Bandswitch
	Knob	54-6160	Flashlight Switch
	Dial Scale	28-10091-1	
	Scale	54-6134	Window (Specify Band)
	Scale	54-613401	Window (Specify Band)
	Dial	76-9152	Backplate Assembly
	Pointer	56-8774-4	
	Lens	54-5206	Glass, Flashlight
	Reflector & Socket Assembly	76-9111	Flashlight



DIAL CORD STRINGING

OF
LANKENSHIP
3524 MEADE ST.
DENVER, COLORADO



1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Set is in broadcast position with volume control maximum negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

IF = 265KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1T4	*	†1.1KΩ	†16KΩ	NC	*	5.5Meg	*
V 2	1R5	*	†1.1KΩ	†16KΩ	100KΩ	*	3Meg	*
V 3	1U4	*	†3.3KΩ	†3.3KΩ	TP	*	2.2KΩ	*
V 4	1U5	*	†680KΩ	†4.7Meg	1.1Meg	TP	4.7Meg	*
V 5	3V4	*	†1.4KΩ	†1.1KΩ	TP	*	3.3Meg	*

ALL READINGS TAKEN WITH SELECTOR SWITCH IN "BROADCAST" POSITION.
† MEASURED FROM OUTPUT OF SELENIUM RECTIFIER (M1).
NC - NO CONNECTION
TP - TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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...TY OF
...SHIP
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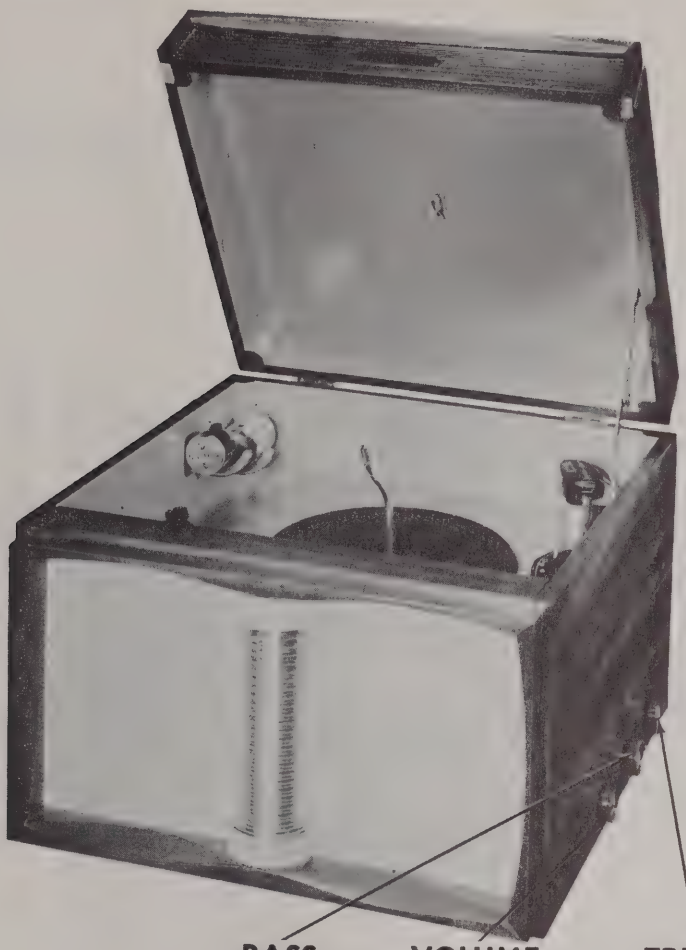
PHILCO MODELS
C-1347, C-1755



PHILCO MODELS
C-1347, C-1755

TRADE NAME	Philco Models C-1347, C-1755
MANUFACTURER	Philco Corp., Tioga & "C" Sts., Philadelphia, Pa.
TYPE SET	AC Operated 6 Watt Audio Amplifier With 3 Speed Automatic Record Changer
TUBES (Three)	Types 12AT7 AF Amp-Phase Inverter, (2) 50L6GT Output
POWER SUPPLY	105-125 Volts AC - 60 Cycles RATING .44 Amp. @ 117 Volts AC

RECORD CHANGER UNIT - PHILCO MODEL M-26

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	AF Amp-Phase Inverter	12AT7	12AT7	9A	
V2	Audio Output	50L6GT	50L6GT	7S	
V3	Audio Output	50L6GT	50L6GT	7S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PHILCO PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.
C1	20	150	30-2568-63			FP173	TM-20-150	S-065
C2A	40	300	30-2568-24			FP447	TM-404020-450	Q-010
B	20	300					TD-20-350	FM-3508
C	40	300						
D	20	300						
C3	10	25	45-3035-6			TC-22	TD-10-25	FM-0210
C4	.01	600	30-4650-58	D6-103	811-01	PT611	IMP6-S1	330611
C5	.0033	400	30-4650-55	D6-332	811-0033	PT6233	IMP6-D33	3306233
C6	.0047	400	30-4650-56	D6-472	811-0047	PT6247	IMP6-D47	3306247
C7	.47	100	30-4656-3					3302047
C8	.01	600	30-4650-58	D6-103	811-01	PT611	IMP6-S1	330611
C9	560	500	60-10565307	TCZ-56	811-561			K-1356
C10	.001	400	30-4650-52	D6-102	801-001	PT621	IMP4-D1	330421
C11	.01	400	30-4650-41	D6-103	811-01	PT411	IMP4-S1	330401
C12	.001	600	30-4650-52	D6-102	801-001	PT621	IMP6-D1	330621
C13	.047	600	30-4650-62	DF-503		PT4147	IMP6-S47	3306147
C14	.1	400	30-4650-47	DF-104		PT401	IMP4-P1	330401
C15	.001	1000	30-4650-86			PT1621	CT10-D1	2116-001
C16	.0047	600	30-4650-56	D6-472	801-0047	PT6247	IMP6-D47	3306247
C17	.0033	1000	30-4650-89			PT16233	CT10-D33	
C18	.01	1000	30-4650-92			PT1611	CT10-S1	2110-01
C19	.01	1000	30-4650-92			PT1611	CT10-S1	2110-01
C20	.1	400	30-4650-47	DF-104		PT401	IMP4-P1	330401
C21	.047	400	30-4650-45	DF-503		PT4147	IMP4-S47	3304147

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2Meg	½	33-5564-18			ABT-175	UDT-296	Volume tapped at 1.2Meg & 250KΩ
B	Shaft		Not Req.			AK-3	Not Req.	Attach to R1A
C	Switch		Not Req.			KB-1	US-26	Attach to R1A
R2A	1Meg	½	33-5565-79	Q13-137	A47-1Meg-Z	B-70	U-53	Bass
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3A	1Meg	½	33-5565-79	Q13-137	A47-1Meg-Z	B-70	U-53	Treble
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R4	1Meg	½	66-5108340	BTS-1Meg	
R5	82KΩ	½	66-3828340	BTS-82K	
R6	22KΩ	½	66-3228340	BTS-22K	
R7	1000Ω	½	66-2108340	BTS-1000	
R8	100KΩ	½	66-4108340	BTS-100K	
R9	220KΩ	½	66-4228340	BTS-220K	
R10	22KΩ	½	66-3228340	BTS-22K	
R11	100KΩ	½	66-4108340	BTS-100K	
R12	1000Ω	½	66-2108340	BTS-1000	
R13	100Ω	½	66-1108340	BTS-100	
R14	100Ω	½	66-1108340	BTS-100	
R15	100KΩ	½	66-4108340	BTS-100K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R16	470KΩ	½	66-4478340	BTS-470K	
R17	120Ω	2	66-1125340		
R18	5600Ω	½	66-2568340	BTS-5600	
R19	2.2Meg	½	66-5228340	BTS-2.2Meg	
R20	3300Ω	½	66-2338340	BTS-3300	
R21	2.2Meg	½	66-5228340	BTS-2.2Meg	
R22	10KΩ	½	66-3108340	BTS-10K	
R23	10KΩ	½	66-3108340	BTS-10K	
R24	10KΩ	2	66-3105340	BTB-10K	
R25	4700Ω	2	66-2475340	BTB-4700	
R26	50Ω	7	33-1335-84	PW7-50	
R27	50Ω		33-1343-6		Note

Note: At normal room temperature, resistance is 880Ω; when hot, resistance is 50Ω.

PHILCO MODEL C-1347

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.1	REPLACEMENT DATA: PHILCO PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	5.4KΩ CT	3.5Ω SEC.2 4ΩCT RES.	32-8670						

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: PHILCO PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	8"	PM	3.5Ω	36-1651-8 ①	8J9	8A31	① Used in model C-1347.
SP2	10"	PM	3.5Ω	36-1653-4 ② 36-1656 ②③	10J11	10A31	② Used in model C-1755. ③ Electrostatic Tweeter

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Crossover Choke	200Ω		32-4628		BC-534	960	103 Microhenries

SELENIUM RECTIFIER

ITEM No.	RATING: CURRENT	REPLACEMENT DATA: PHILCO PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.103A	34-8003-2	1005A	RS150	6S150	5P1	150	
M2	.103A	34-8003-2	1005A	RS150	6S150	5P1	150	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: PHILCO PART No.	ASTATIC PART No.: CARTRIDGE	ASTATIC PART No.: NEEDLE	ELECTRO-VOICE PART No.: CARTRIDGE	ELECTRO-VOICE PART No.: NEEDLE	REMARKS
M3	425-0009					

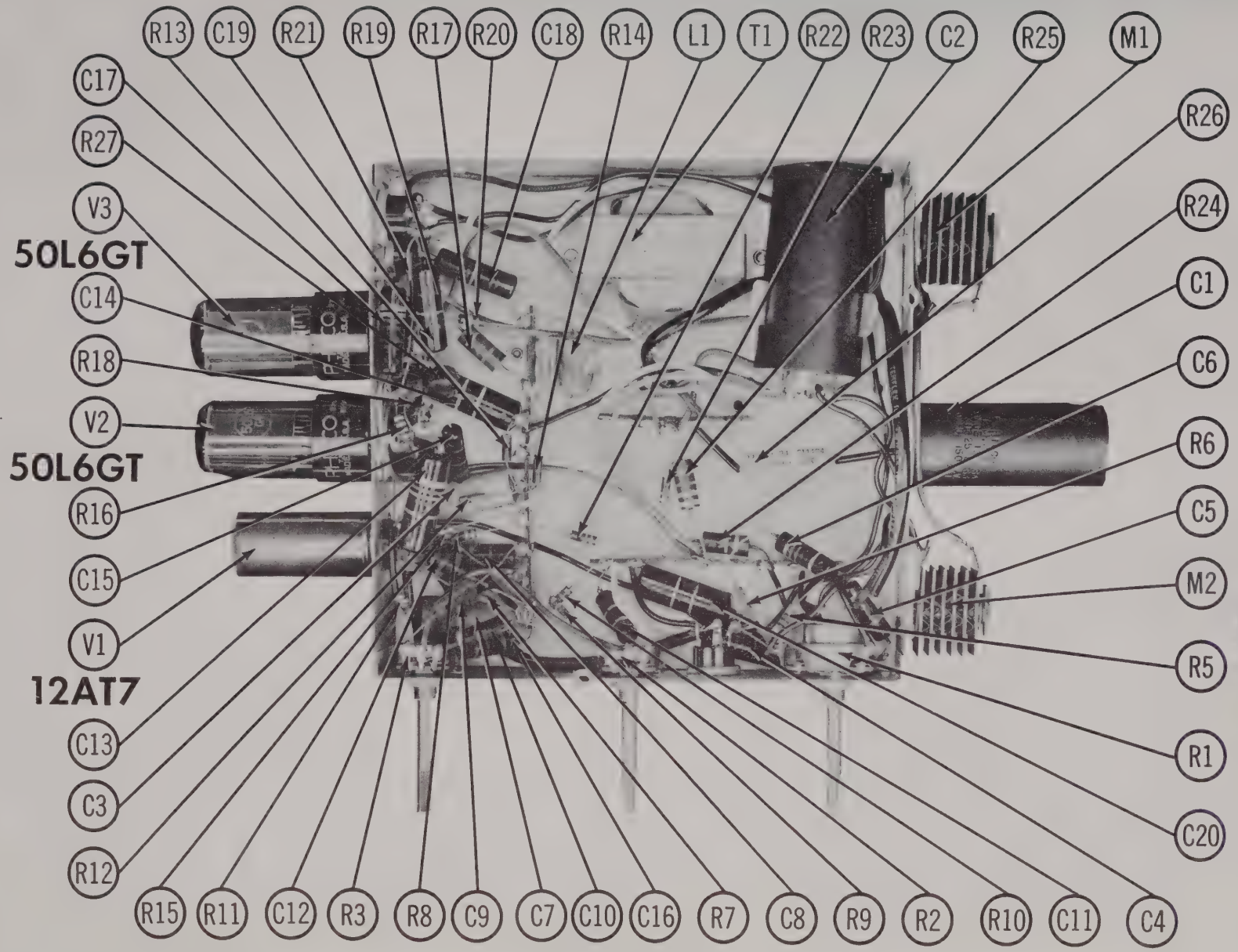
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA: PHILCO PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	REMARKS
M4	45-9787	*PH-12 or †PH-13 or ♦†PH-13SD or ♦PH-13D	†AC-455 or ♦†AC-455D1 or †♦AC-455D2 or ♦AC-455D		* Metal † Jewel ♦ Diamond

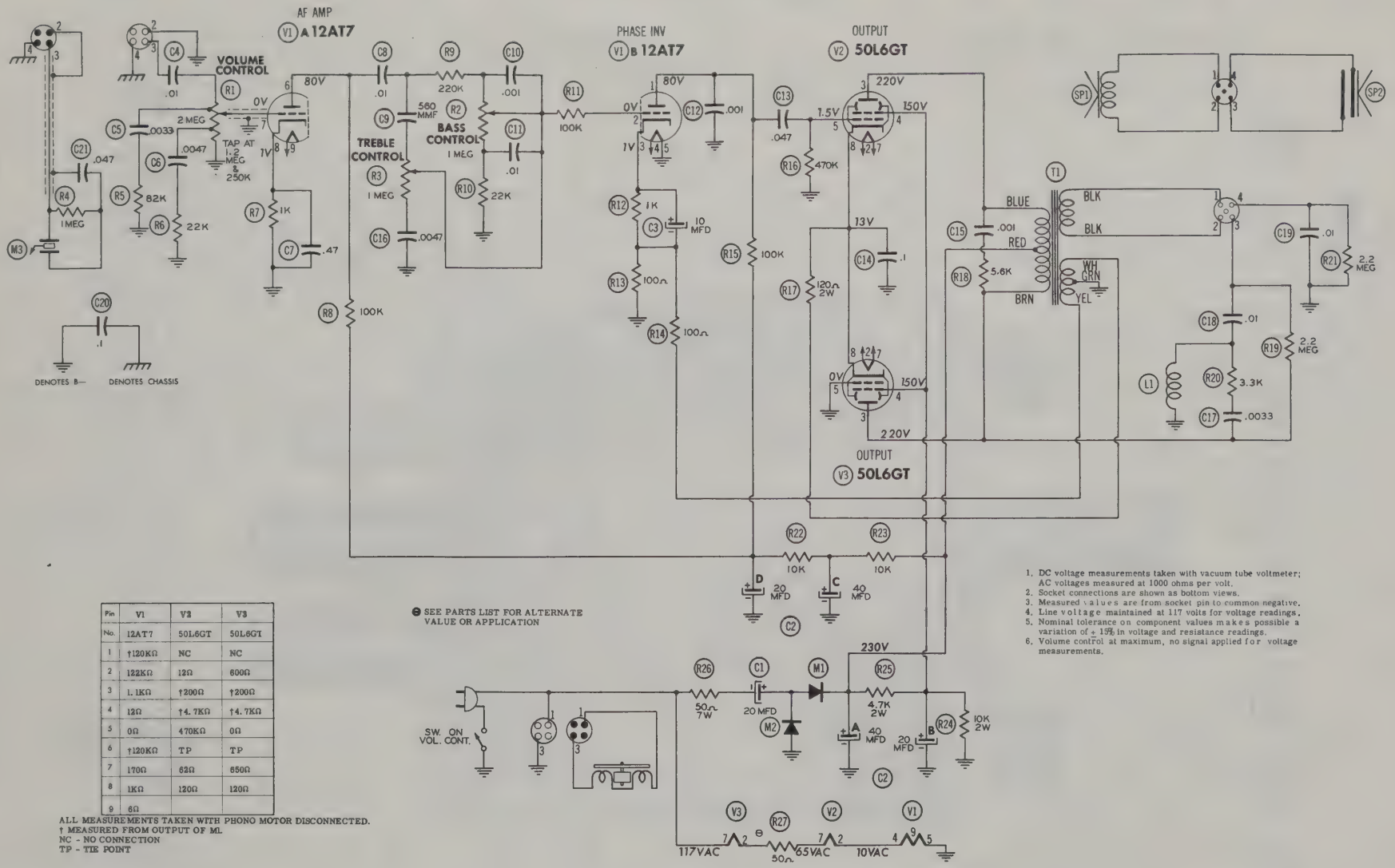
MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
	Cabinet	11061-1	Light - Model C-1347
	Cabinet	11061	Mahogany - Model C-1347
	Cabinet	10985-3	Light - Model C-1755
	Cabinet	10985-2	Mahogany - Model C-1755
	Knob	54-4773-8	Control (Light) - 3 used - Model C-1347
	Knob	54-4773-10	Control (Mahogany) - 3 used - Model C-1347
	Knob		Control - 3 used - Model C-1755



CHASSIS BOTTOM VIEW

3924 MEADE ST.
DENVER, COLORADO



Pin No.	V1 12AT7	V2 50L6GT	V3 50L6GT
1	†120KΩ	NC	NC
2	122KΩ	12Ω	600Ω
3	1.1KΩ	†200Ω	†200Ω
4	12Ω	†4.7KΩ	†4.7KΩ
5	0Ω	470KΩ	0Ω
6	†120KΩ	TP	TP
7	170Ω	62Ω	650Ω
8	1KΩ	120Ω	120Ω
9	6Ω		

ALL MEASUREMENTS TAKEN WITH PHONO MOTOR DISCONNECTED.
† MEASURED FROM OUTPUT OF M1.
NC - NO CONNECTION
TP - TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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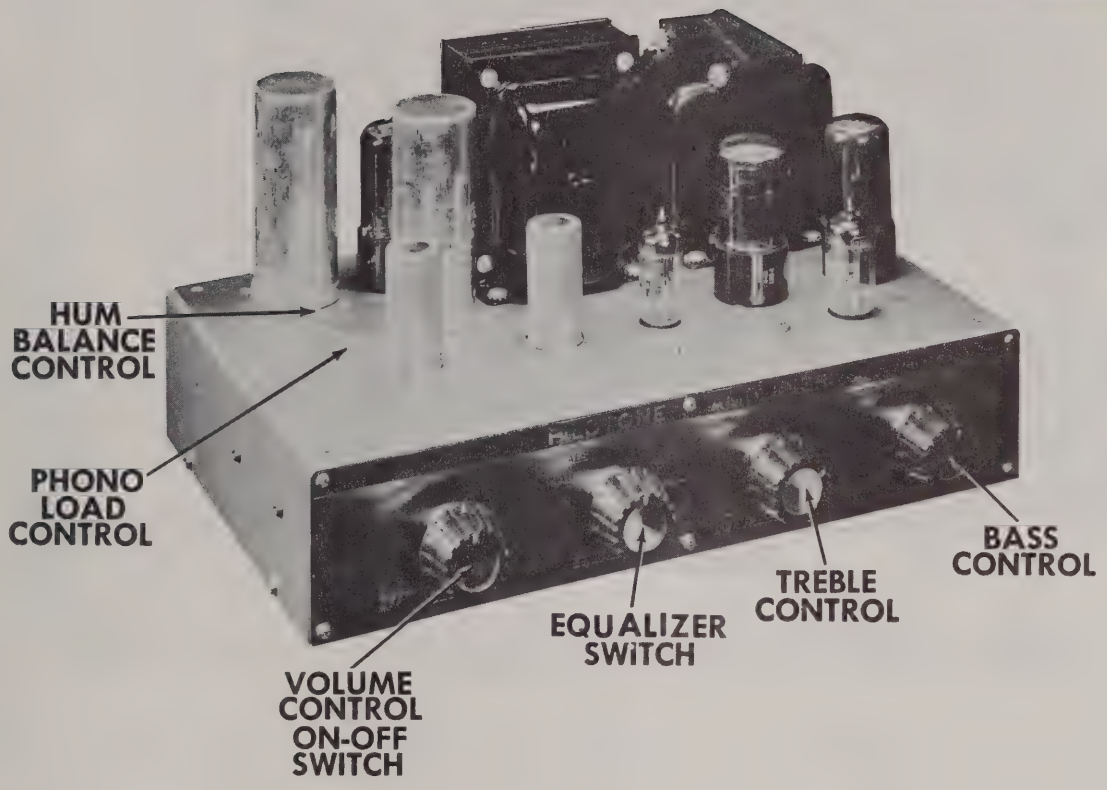

PILOT
MODEL AA-903

TRADE NAME	Pilot Model AA-903
MANUFACTURER	Pilot Radio Corp., 37-06 36th St., Long Island City, N.Y.
TYPE SET	AC Operated 4 Channel 10 Watt Audio Amplifier & Equalizer
TUBES (Seven)	Types 12AX7 Preamp., 12AX7 AF Amp., 6C4 AF Amp., 12AU7 AF Amp-Phase Inv., (2) 6V6GT Output, 5Y3GT Rectifier
POWER SUPPLY	105-120 Volts AC - 60 Cycles RATING .67 Amp. @ 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

PILOT
MODEL AA-903

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		PILOT PART No.	STANDARD REPLACEMENT		
V1	Preamp.	12AX7	12AX7	9A	
V2	AF Amp.	12AX7	12AX7	9A	
V3	AF Amp.	6C4	6C4	6BG	
V4	AF Amp. - Phase Inverter	12AU7	12AU7	9A	
V5	Audio Output	6V6GT	6V6GT	7S	
V6	Audio Output	6V6GT	6V6GT	7S	
V7	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT	PILOT PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	▲20	450				FP448	TM-602020-450	Q-040	
B	■60	450					TD-20-450	MT-4540	
C	▲20	450							
D	20	450							
C2A	■10	400					TM-4020-450	T-710	
B	▲40	400					TD-250-50	FM-15150	
C	▲200	50							
C3	.022	400		DF-203	817-02	PT4122	IMP4-S22	3304122	
C4	.005	600		D6-502	811-005	PT625	IMP6-D5	330625	
C5	.0051	400		D6-502	811-005	PT625	IMP6-D5	330625	
C6	.033	400				PT4133	IMP4-S3	3306133	
C7	.022	400		DF-203	817-02	PT4122	IMP4-S22	3304122	
C8	800				831-801				
C9	.022	400		DF-203	817-02	PT4122	IMP4-S22	3304122	
C10	.033	400				PT4133	IMP4-S3	3306133	
C11	50			D6-5000	GP1K-500	UC-545		K-4450	
C12	1000			D6-102	831-001	UC-521		C-2211	
C13	1200			D6-122	GP2L-122	UC-5212		C-2212	
C14	.047	400		DF-503		PT4147	IMP4-S47	3304147	
C15	3.3			TCZ-3.3	NP0A-3R3				
C16	.047	400		DF-503		PT4147	IMP4-S47	3304147	
C17	.1	600		DF-104		PT601	IMP4-P1	330601	
C18	.047	600		DF-503		PT6147	IMP6-S47	3306147	
C19	.047	600		DF-503		PT6147	IMP6-S47	3306147	
C20	.002	600		D6-202	801-002	PT622	IMP6-D2	330622	Note 1
C21	5000			D6-502	811-005	UC-525	IMP6-D5	330625	

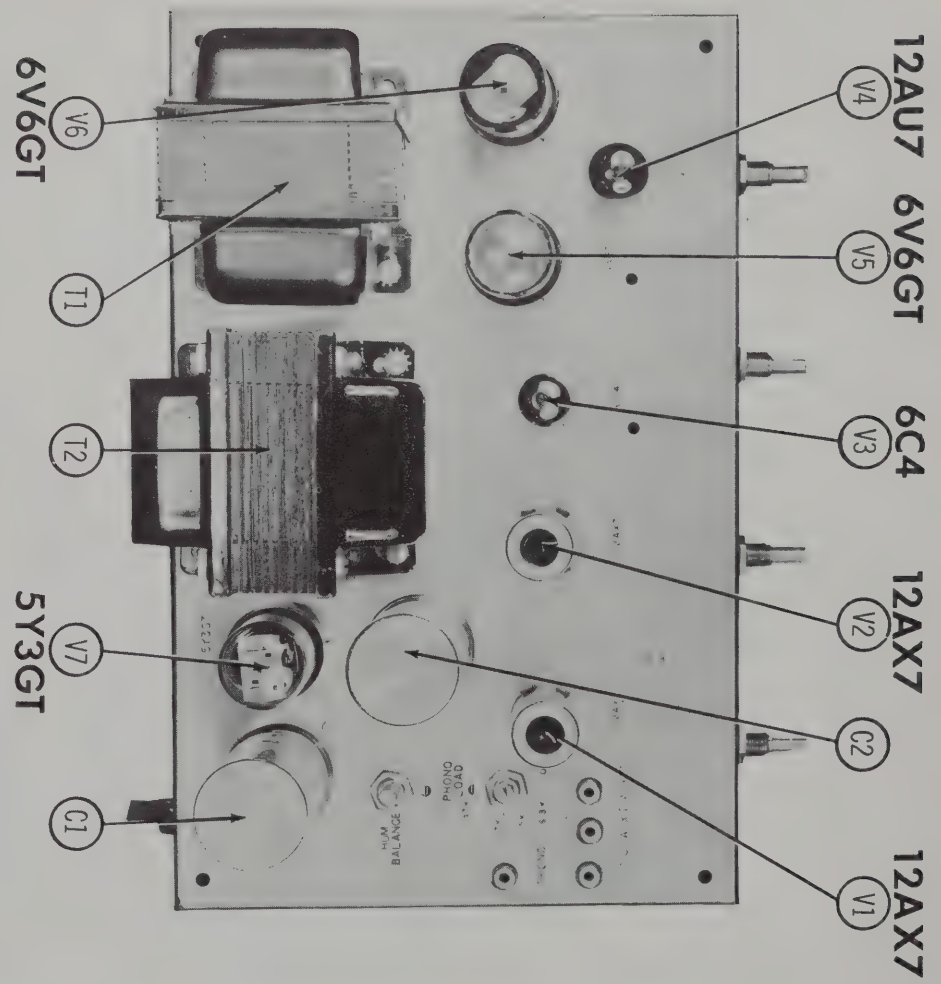
Note 1: Some versions may use a .02MFD in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PILOT PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	36-47A	Q11-133			UF55L	Volume
B	1Meg	½		M11-137			UR16L	
C	Shaft			Not Req.			DS-36	Attach to R1A
D	Switch			76-1			US-26	Attach to R1B
R2A	5Meg	½	37-26	Q13-141	A47-5Meg-Z		U-65	Treble
B	Shaft		Not Req.	Not Req.	FS-3		Not Req.	Attach to R2A
R3A	5Meg	½	37-26	Q13-141	A47-5Meg-Z		U-65	Bass
B	Shaft		Not Req.	Not Req.	FS-3		Not Req.	Attach to R3A
R4A	25KΩ	½	39-33	Q11-120	A47-25K-S	AB-26	U-29	Hum Balance
B	Shaft		Not Req.	Not Req.	RS-2	AK-1	Not Req.	Attach to R4A
R5A	100KΩ	½	39-32C	Q11-128	A47-100K-S	AB-40	U-41	Phono Load - Note
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A

Note: Some versions may use an alternate control part no. 39-32.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PILOT PART No.	IRC PART No.	
R6	6800Ω	1/2		BTS-6800	
R7	2.2Meg	1/2		BTS-2.2Meg	Note 1
R8	68KΩ	1		BTA-68K	
R9	680KΩ	1/2		BTS-680K	Note 2
R10	8200Ω 5%	1/2		BTS-8200 5%	
R11	1Meg	1/2		BTS-1Meg	
R12	82KΩ 5%	1/2		BTS-82K 5%	
R13	100KΩ 5%	1/2		BTS-100K 5%	
R14	68KΩ 5%	1/2		BTS-68K 5%	
R15	39KΩ 5%	1/2		BTS-39K 5%	
R16	2.2Meg	1/2		BTS-2.2Meg	Note 3
R17	3300Ω	1		BTA-3300	Note 4
R18	82KΩ	1		BTA-82K	
R19	15KΩ	1/2		BTS-15K	
R20	2200Ω	1		BTA-2200	
R21	82KΩ	1		BTA-82K	
R22	220KΩ 5%	1/2		BTS-220K 5%	
R23	220KΩ	1/2		BTS-220K	
R24	4700Ω 5%	1/2		BTS-4700 5%	
R25	220KΩ	1/2		BTS-220K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PILOT PART No.	IRC PART No.	
R26	100KΩ 5%	1/2		BTS-100K 5%	
R27	2200Ω	1		BTA-2200	
R28	82KΩ	1		BTA-82K	
R29	5600Ω	1/2		BTS-5600	
R30	220KΩ	1/2		BTS-220K	
R31	470KΩ	1/2		BTS-470K	
R32	10KΩ	1/2		BTS-10K	
R33	220KΩ	1/2		BTS-220K	
R34	47KΩ 5%	1/2		BTS-47K 5%	
R35	47KΩ 5%	1/2		BTS-47K 5%	
R36	470KΩ	1/2		BTS-470K	
R37	250Ω	4		PW4-250	
R38	470KΩ	1/2		BTS-470K	
R39	6800Ω	1/2		BTS-6800	
R40	5600Ω	2		BTB-5600	
R41	10KΩ	1/2		BTS-10K	
R42	27KΩ	1		BTA-27K	
R43	100Ω	2			
R44	220KΩ	1/2		BTS-220K	
R45	39KΩ	1/2		BTS-39K	

Note 1: Some versions may use a 3.3Meg resistor in this application.
Note 2: Some versions may use a 1Meg resistor in this application.
Note 3: Not used in some versions.
Note 4: Some versions may use a 2200Ω resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	PILOT PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @ .67A	666VCT .082A	5VAC @ 2A	6.3VAC @ 2A	55-38	PC-8409 ① ②			P9310 ① ②	

① Drill new mounting holes.
② Tape 6.3V center tap.

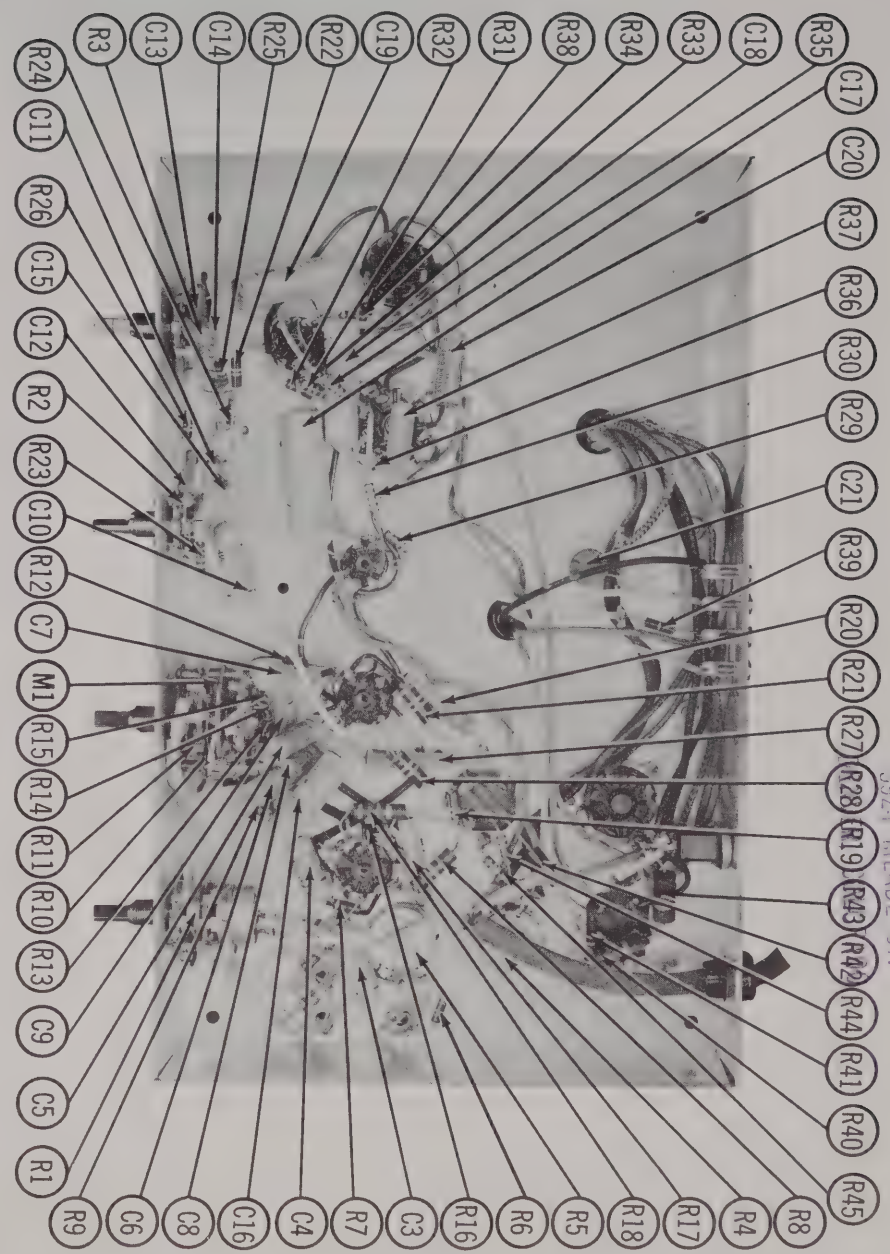
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	PILOT PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	8.9KΩ CT	16Ω Tap @ 8Ω @ 4Ω	56-36			S-31A	Z1405 ①	22S44 ①	① Drill one new mounting hole.

MISCELLANEOUS

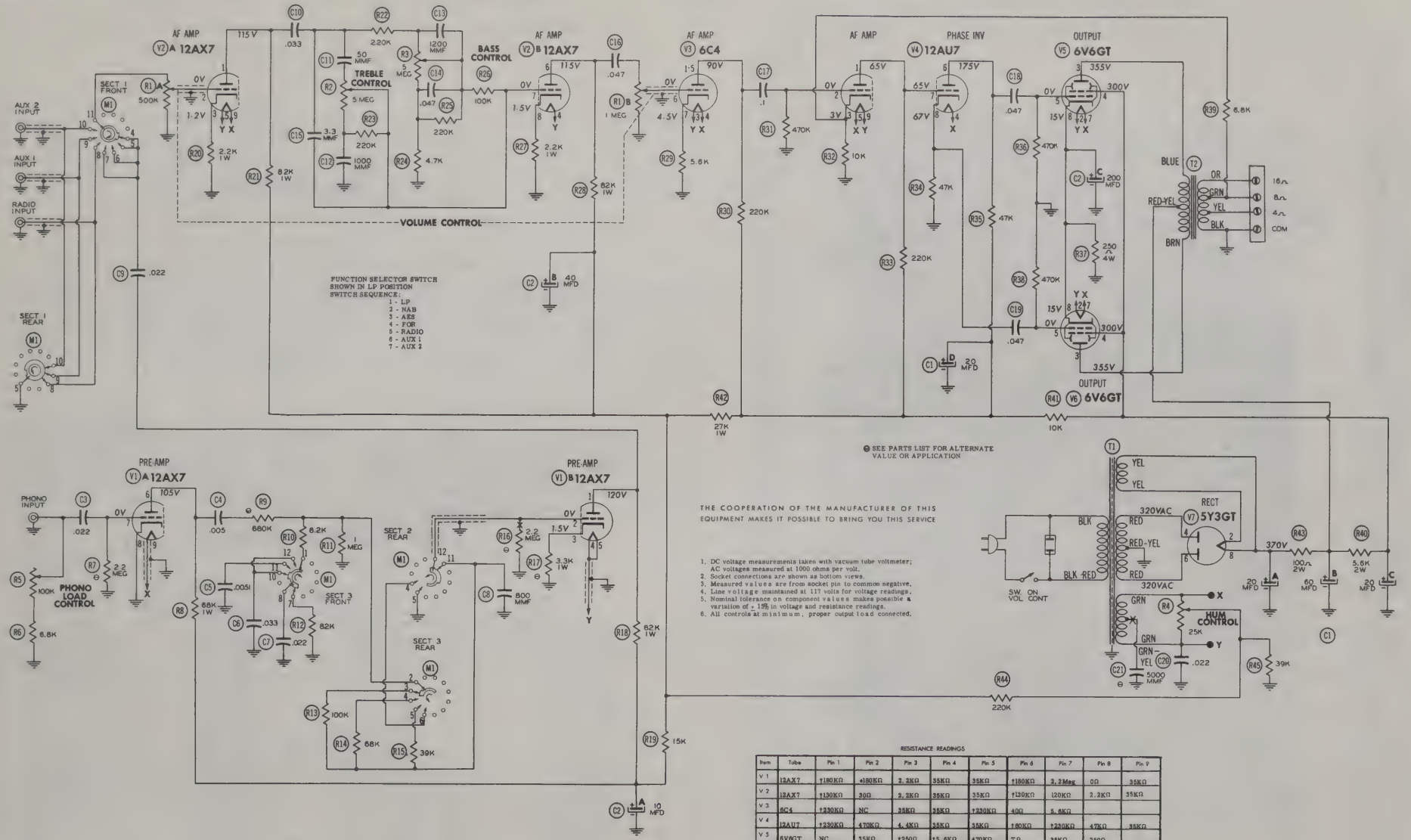
ITEM No.	PART NAME	PILOT PART No.	NOTES
M1	Switch		Equalizer & Selector

CHASSIS—BOTTOM VIEW



3924 MEADE ST.

PILOT MODEL AA-903



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	†180KΩ	•180KΩ	2.2KΩ	35KΩ	35KΩ	†180KΩ	3.2MegΩ	0Ω	35KΩ
V 2	12AX7	†130KΩ	30Ω	2.2KΩ	35KΩ	35KΩ	†130KΩ	120KΩ	2.2KΩ	35KΩ
V 3	6C4	†230KΩ	NC	35KΩ	35KΩ	†230KΩ	40Ω	5.6KΩ		
V 4	12AU7	†230KΩ	470KΩ	4.4KΩ	35KΩ	35KΩ	†80KΩ	†230KΩ	47KΩ	35KΩ
V 5	6V6GT	NC	35KΩ	†250Ω	†5.6KΩ	470KΩ	TP	35KΩ	250Ω	
V 6	6V6GT	NC	35KΩ	†250Ω	†5.6KΩ	470KΩ	TP	35KΩ	250Ω	
V 7	5Y3GT	NC	70KΩ	NC	130Ω	NC	130Ω	NC	70KΩ	

† MEASURED FROM PIN 2 OF V1.
• MEASURED WITH SELECTOR SWITCH IN PHONO (L.P) POSITION.
NC - NO CONNECTION
TP - TIE POINT

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RCA VICTOR MODELS 5-X-560, 5-X-562, 5-X-564 (Ch. RC-1150)

RCA VICTOR MODELS 5-X-560, 5-X-562, 5-X-564 (Ch. RC-1150)

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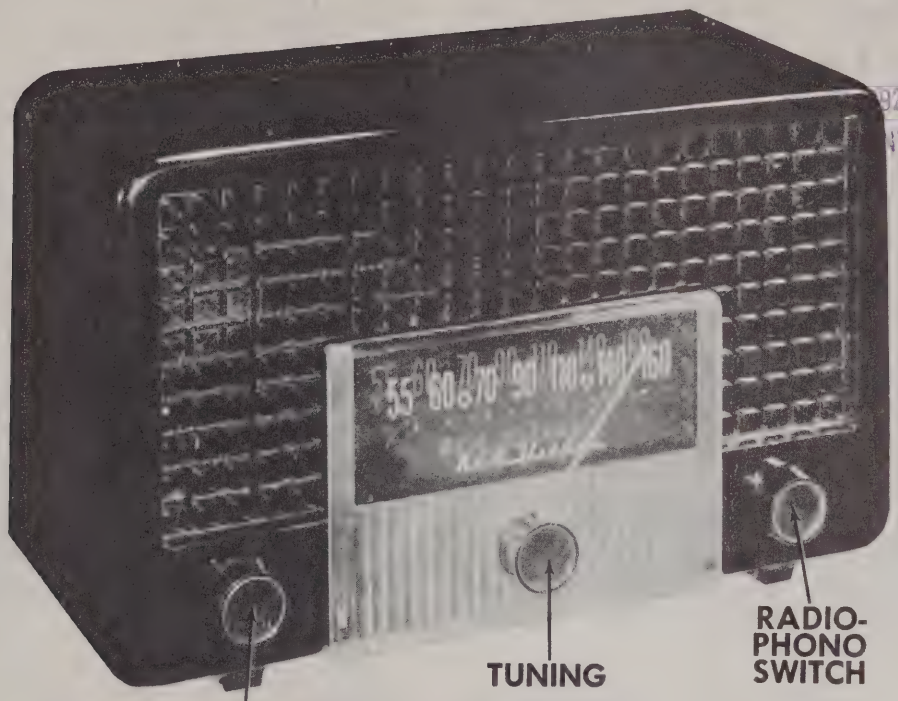
...824 MEADE ST.
...NVER, COLORADO



RCA VICTOR MODELS 5-X-560, 5-X-562, 5-X-564 (Ch. RC-1150)

TRADE NAME	RCA Victor Models 5-X-560, 5-X-562, 5-X-564 (Ch. RC-1150)
MANUFACTURER	RCA Victor Radio & "Victrola" Div., Radio Corp. of America, Camden, N.J.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC — RATING .23 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC-1600 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 1 (grid) of 12BA6 (V2). Low side to chassis.	455KC (400~Mod)	Point of non-interference	Across voice coil	A1, A2,	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	High side to ant. terminal on stator. Low side to chassis.	"	"	"	A3, A4	"
3.		Loop (Radiated)	1620KC	Tuning gang fully open	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	1400KC	Tune to 1400KC signal	"	A6	"
5.		"	600KC	Tune to 600KC signal	"	A7	Adjust for maximum output while rocking tuning gang.

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PARTS LIST AND DESCRIPTIONS

RCA VICTOR
MODEL 5-X-560 (Ch. RC-1150)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: RCA Victor PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det.-AVC-AF Amp	12AV6	12AV6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: RCA Victor PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	50	150	73718			TCD497	TDL-5030-150	FMD-301	
B	30	150							
C2	56		75784	D6-560	GP1K-560	UC-5456		K-1456	
C3	.047	400	73353	DF-503		PT4147	IMP4-S47	3304147	
C4A	220		♦79058	♦PC-151	♦1408-02				
B	5000								
C	5000								
D	250								
E									
C5	.015	400	73797			PT6115	IMP6-S15	3306115	
C6	.047	400	75071	DF-503		PT4147	IMP4-S47	3304147	
C7	.1	400	73551	DF-104		PT401	IMP4-P1	330401	

♦ Items C4A, C4B, C4C, C4D, C4E, R7A, R7B and R7C are combined in one unit.
When replacing items separately C4D and C4E should total 250MMF.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: RCA Victor PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	38409	Q13-133	A47-500K-Z	B-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: RCA Victor PART No.	IRC PART No.	NOTES
R2	33KΩ	½	502333	BTS-33K	
R3	100Ω	½	502110	BTS-100	
R4	100Ω	½	502110	BTS-100	
R5	47KΩ	½	502347	BTS-47K	
R6	3.3Meg	½	502533	BTS-3.3Meg	

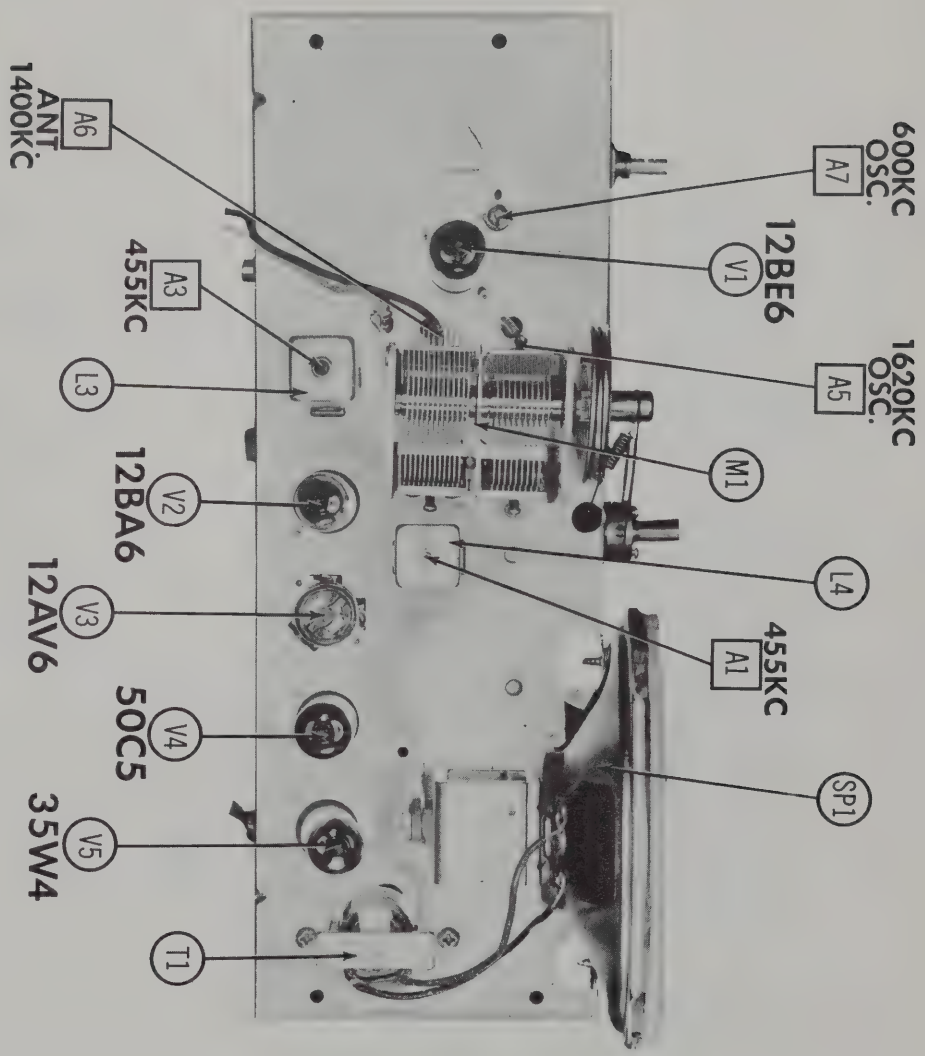
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: RCA Victor PART No.	IRC PART No.	NOTES
R7A	6.8Meg	½	♦79058	BTS-6.8Meg	
B	470KΩ	½		BTS-470K	
C	470KΩ	½		BTS-470K	
R8	150Ω	½	502115	BTS-150	
R9	1200Ω	1	512212	BTA-1200	
R10	33Ω	1	512033		

♦ Items R7A, R7B, R7C, C4A, C4B, C4C, C4D, C4E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: RCA Victor PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	2.4KΩ	3.4Ω	79283	A-3336 ①	A-3031 ①		Z1102 ①	24S50A①	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

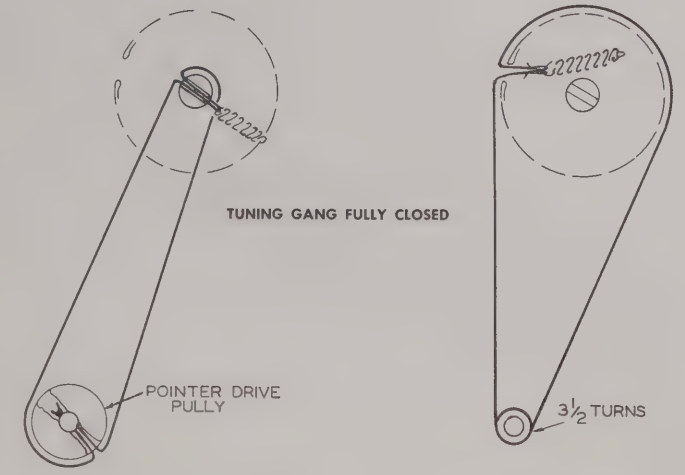
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	2.1Ω		79887				Includes cabinet back
L2	Osc. Coil	.6Ω	5Ω	79057	14-1074 *	BC-381 ■	71-OSC	
L3	Input IF	15Ω	15Ω	75486	16-6758	BC-352	12-C1	
L4	Output IF	16Ω	16Ω	75487	16-6770	BC-355	12-C6	

* Leads have sufficient mounting support.
■ Drill mounting hole.

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M1	Tuning Cap.	79891	2 Gang (21-425MMF, 19-135MMF)
M2	Switch	79886	Radio-Phono (SPDT)
	Cabinet	Y2720	Model 5-X-560
	Cabinet	Y2721	Model 5-X-562
	Cabinet	Y2722	Model 5-X-564
	Knob	79890	Control - Model 5-X-560 (3 used)
	Knob	78036	Control - Model 5-X-562 (3 used)
	Knob	78034	Control - Model 5-X-564 (3 used)
	Pointer	78041	Station Selector
	Dial	79889	Model 5-X-560
	Dial	79888	Models 5-X-562 and 5-X-564

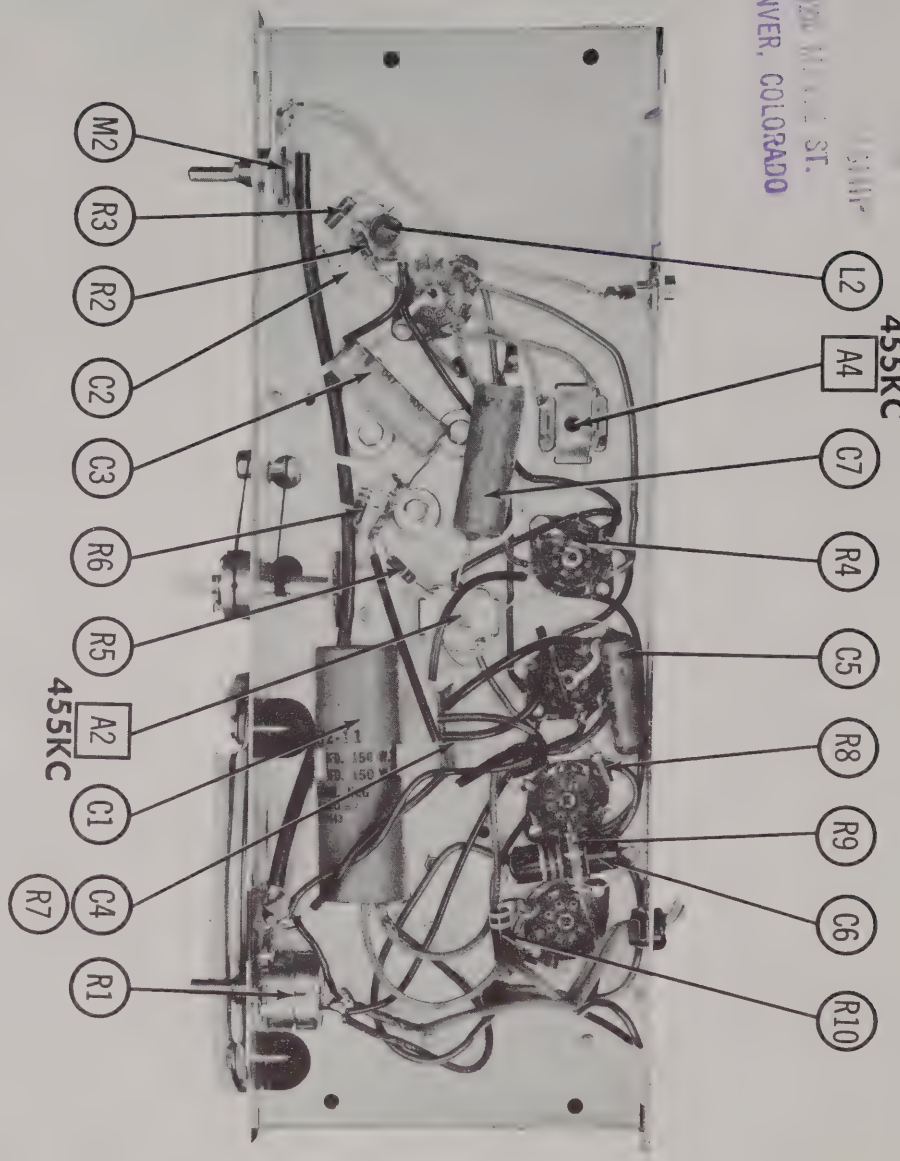


TUNING INDICATOR

TUNING CONDENSER

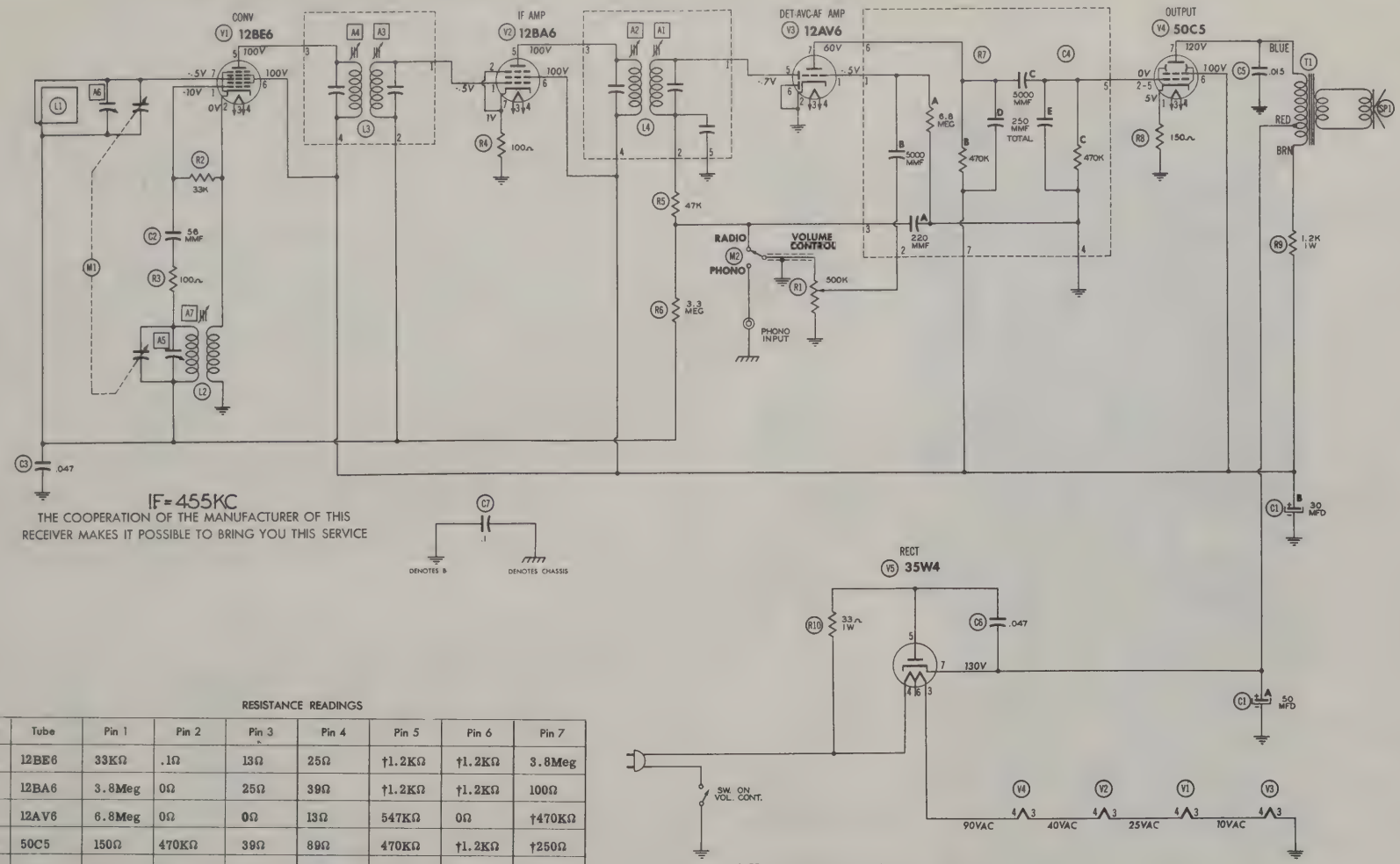
DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



DENVER, COLORADO

RCA VICTOR
MODEL 5-X-560 (Ch. RC-1150)



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	33KΩ	.1Ω	13Ω	25Ω	†1.2KΩ	†1.2KΩ	3.8Meg
V 2	12BA6	3.8Meg	0Ω	25Ω	39Ω	†1.2KΩ	†1.2KΩ	100Ω
V 3	12AV6	6.8Meg	0Ω	0Ω	13Ω	547KΩ	0Ω	†470KΩ
V 4	50C5	150Ω	470KΩ	39Ω	89Ω	470KΩ	†1.2KΩ	†250Ω
V 5	35W4	TP	NC	89Ω	120Ω	168Ω	135Ω	90KΩ

ALL MEASUREMENTS TAKEN WITH RADIO-PHONO SWITCH IN "RADIO" POSITION
† MEASURED FROM PIN 7 OF V5
TP - TIE POINT
NC - NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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PHOTOFACT* Folder

RCA VICTOR MODELS 21-S-548, U
(Ch. KCS88N, P & Radio Tuner Ch. RK191)

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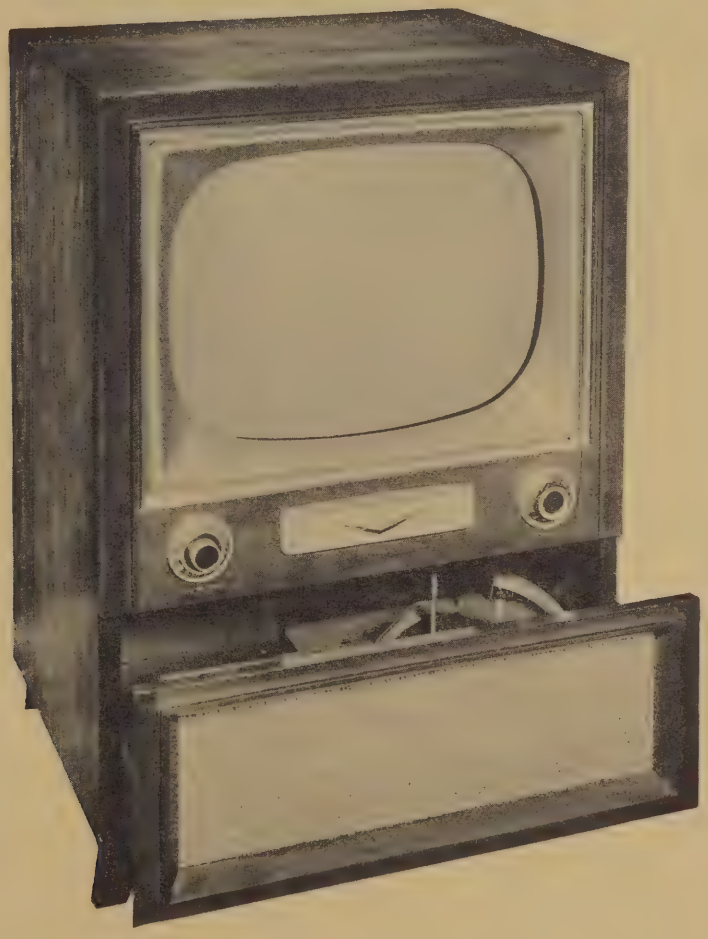

MODEL 21-S-548

RCA VICTOR MODELS 21-S-548, U
(Ch. KCS88N, P & Radio Tuner Ch. RK191)

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DATE 6–55 SET 279 FOLDER 13

RCA VICTOR MODELS 21-S-548, U (Ch. KCS88N, P & Radio Tuner Ch. RK191)

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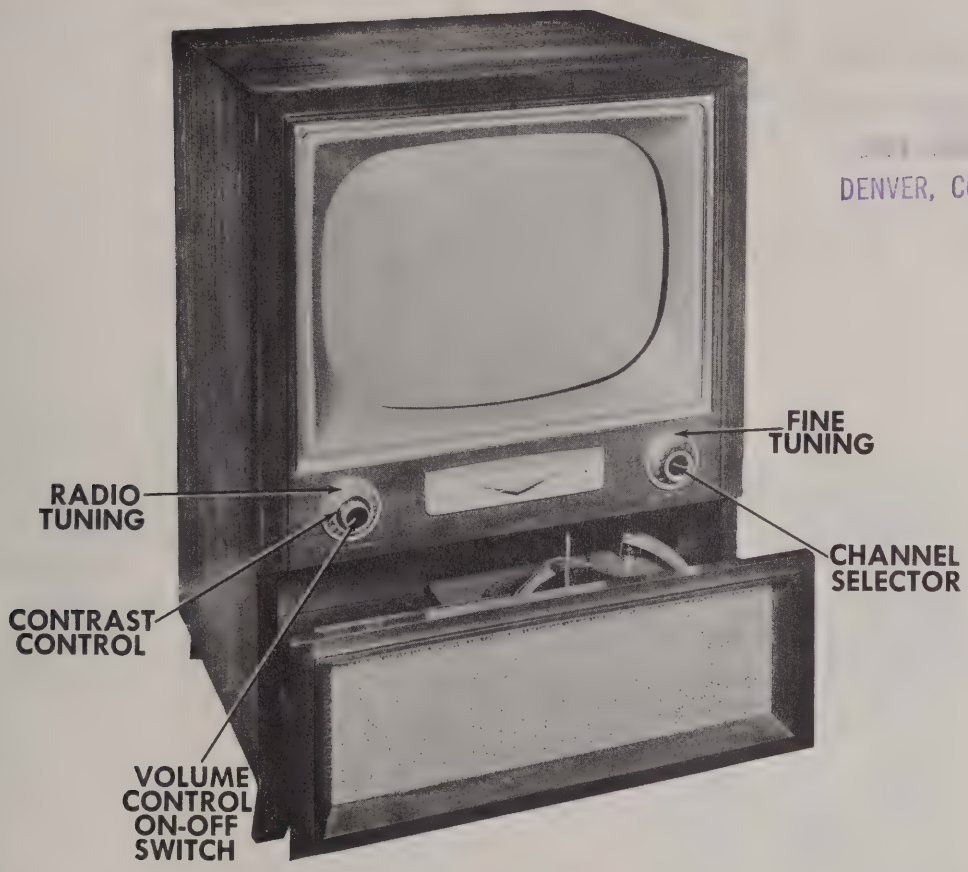

RCA VICTOR MODELS 21-S-548, U
(Ch. KCS88N, P & Radio Tuner Ch. RK191)

RCA VICTOR MODEL 21-S-548

TRADE NAME	RCA Victor Models 21-S-548 (Ch. KCS88N), 21-S-548U (Ch. KCS88P) & Radio Tuner Ch. RK191
MANUFACTURER	Radio Corp. of America, RCA Victor - Television Div., Camden 2, N.J.
TYPE SET	TV-Radio-Phono Combination Receiver
TUBES	Twenty-one
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 1.4 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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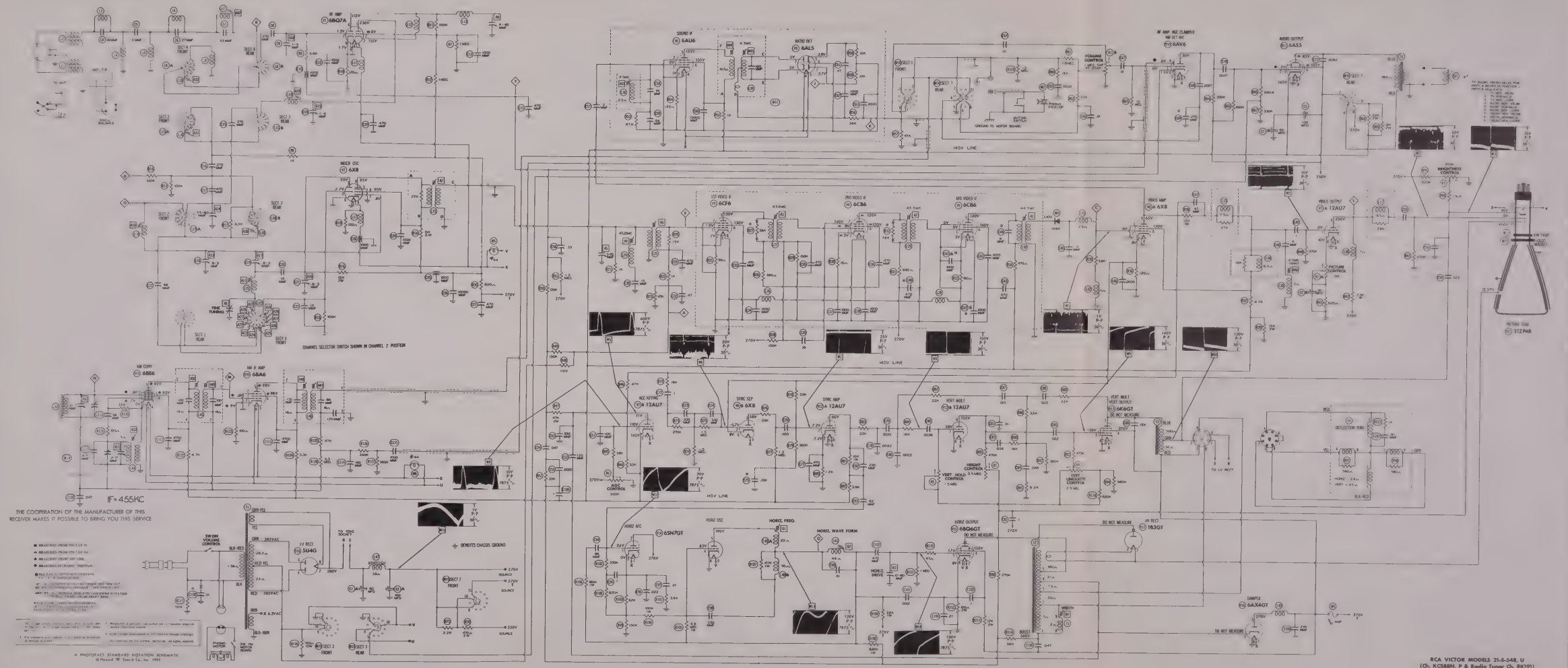
IF = 45.5KC
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 2 POSITION
145V LINE
DENOTES CHASSIS GROUND
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1955
RCA VICTOR MODELS 21-5-548, U
(Ch. KCS88N, P & Radio Tuner Ch. RK191)

...Y OF
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3924 MEADE ST.
DENVER, COLORADO

CHASSIS TOP VIEW

RCA VICTOR MODELS 21-S-548,
U (Ch. KCS88N, P & Radio Tuner Ch. RK191)

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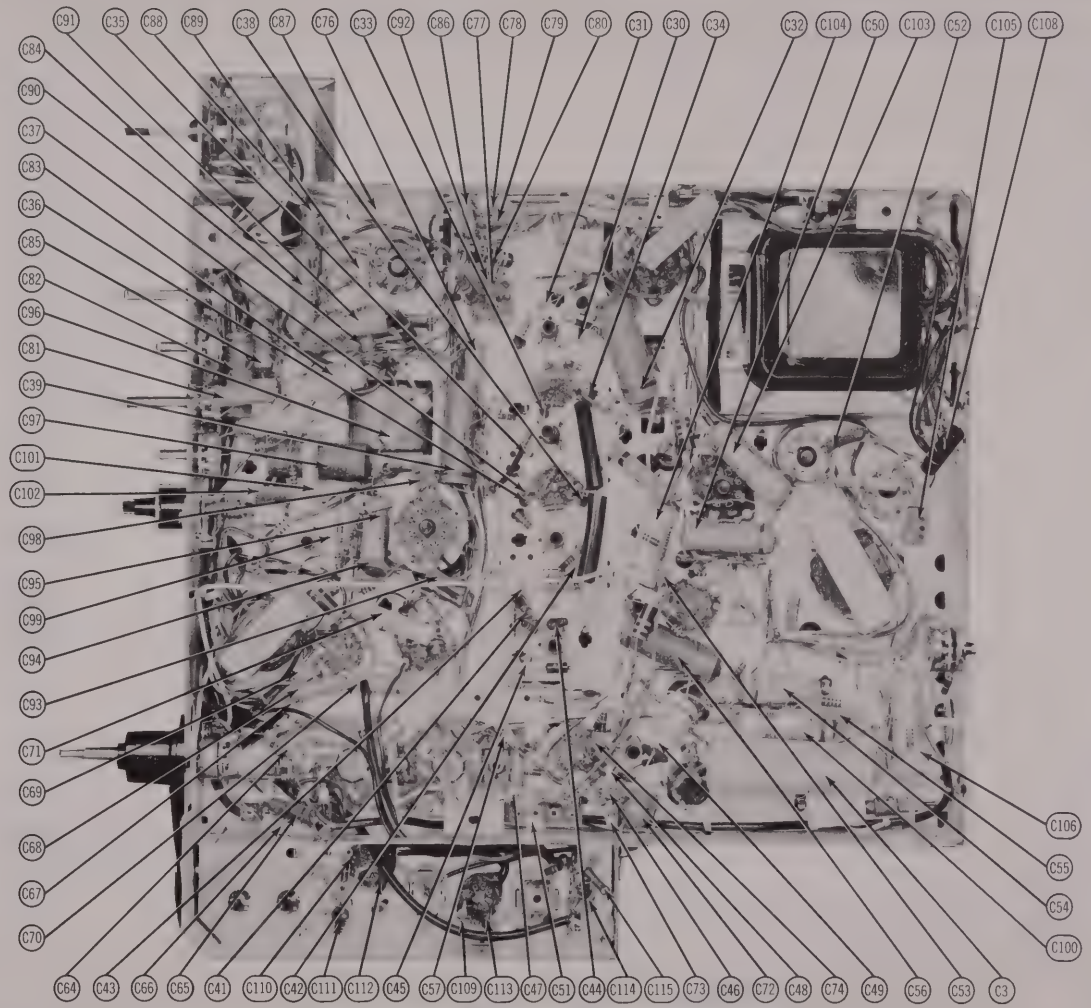


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3974 MEADE ST.
DENVER, COLORADO

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

M-1 may be removed to prevent shock hazard during alignment. If not removed the high voltage lead should be taped securely away from the chassis.

KRK22D VIDEO IF ALIGNMENT

Turn AGC control to its fully clockwise position.
Connect the ends of a 1000Ω potentiometer across a 7.5 volt battery capable of withstanding considerable current drain.
Connect positive terminal to chassis and the potentiometer arm to point Ⓐ. Set the potentiometer arm to obtain - 4 volts at point Ⓐ.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.0015MFD Ceramic Capacitor	High side to point Ⓓ. Low side to chassis.	Not used	44.5MC	Any not used locally	Use VTVM DC probe to point Ⓒ. Common to chassis.	A1	Attenuate generator output to maintain not more than -3 volts on VTVM. Adjust for maximum deflection.
2.	"	"	"	45.5MC	"	"	A2	"
3.	"	"	"	43.0MC	"	"	A3	"
4.	"	"	"	47.25MC	"	"	A4	Increase generator output to maintain 3 volts on VTVM. Adjust for MINIMUM deflection. Core of coil should be nearest to chassis when properly adjusted.
5.	"	High side to point Ⓓ. Low side to tuner chassis	44MC (10MC Swp)	42.5MC 45.75MC	4	Vert. Amp. of scope thru detector (Fig.1) probe to pin 5 of 6CF6 (V3). Low side to chassis.	A5, A6, A7	Adjust bias to read - 4 volts at point Ⓐ Clip a carbon 330Ω resistor from pin 1 of V5 to chassis. Connect a 180Ω carbon resistor from plate to screen of V3. Preset A5 to MINIMUM capacity. If a separate signal generator is used for marker. Couple it loosely to detector (Fig.1). Attenuate output of sweep generator to give 3 to 5 volts peak to peak on scope. Adjust A6 and A7 for maximum gain with 45.75MC at 75% of maximum response as in Fig. 2. Adjust A5 to place 42.5MC marker at 70% response on curve (Fig. 2).
6.	"	"	"	42.5MC 45.0MC 45.75MC	4	Vert. Amp. to point Ⓒ. Low side to chassis.	A1, A2, A3	Disconnect the 180Ω and the 330Ω resistors. Retouch A1, A2 and A3 if necessary to obtain response curve similar to Fig. 3. Attenuate output of generator to obtain 3 to 5 volts peak to peak on oscilloscope.
7.	"	"	"	41.25MC	"	"	A1, A3	Increase sweep output ten times and notice attenuation at 41.25MC. Adjust A1 and A3 to set 41.25MC marker at approximately 30 times down with response curve as shown in Fig. 3.
8.	Two 130Ω Carbon Resistor	Across antenna terminals with 130Ω in series with each lead.	"	42.5MC 45.75MC	All Separately	"	A1, A2	Connect negative lead of 3 volt bias to point Ⓕ. Positive to chassis. SLIGHTLY readjust A1 and A2 to correct any overall tilt while switching from channel to channel. (Fig. 3.).

KRK22D TUNER ALIGNMENT

An RF tuner unit which is operative and requires minor touch-up adjustments will require no presetting of adjustments.
When complete alignment is necessary make the following preadjustments.

1. Preset A8 all the way out.
2. Set channel 7 thru 13 oscillator slugs one turn from tight.
3. Adjust A7 slug all the way out.
4. Disconnect the link from terminal A and B of L23 and terminate the link with a 39Ω carbon resistor.

Tuner alignment as outlined below requires the use of a heterodyne frequency meter. The limits of oscillator injection voltage are 2 volts minimum and 5.5 volts maximum measured at point Ⓖ with a VTVM.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to point Ⓑ. Low side to chassis.	Not used	43.5MC (400∿Mod)	2	Vert. Amp. to point Ⓖ. Low side to chassis.	A9	Adjust scope for maximum gain. Short out AGC at point Ⓕ. Adjust A9 for MINIMUM output at 400∿ indication on scope. If necessary A9 may be adjusted in field to provide additional rejection of a specific frequency. Exercise care so that A9 is not tuned into channel 2 reducing that channels's sensitivity. Remove short from tuner AGC terminal at point Ⓕ.
10.		RF input heterodyne frequency meter to end of insulated wire inserted in hole provided for adjustment of A14.	"	Set freq. meter to 227MC	8	Not used	A10, A8	Connect potentiometer arm of bias supply to point Ⓕ. Positive lead to chassis. Adjust for negative 3 volts at point Ⓖ Turn fine tuning control maximum clockwise. Adjust A10 for audible beat on freq. meter. Adjust A8 clockwise until beat note just begins to change, then turn one full turn in same clockwise direction. Return fine tuning control to its mid-range position.
	NOTE: If channel 8 oscillator frequency cannot be reached by adjustment of A10 switch to channel 13 and adjust A11 for channel 13 oscillator frequency. Then switch to channel 12 and adjust A12 for channel 12 oscillator frequency. Continue to channel 8, adjust proper oscillator trimmer to obtain proper oscillator frequency on each channel. Also, on channel 8 adjust A10 for channel 8 oscillator frequency. Switch to channel 13 and adjust A11, then switch back to channel 8 and adjust A10 again.							
11.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	183MC (10MC Swp)	181.25MC 185.75MC	8	Vert. Amp. to point Ⓖ. Low side to chassis.	A13, A14, A15, A16	Set A7 fully counter clockwise. Set scope gain to maximum and attenuate generator output for MINIMUM input signal that will produce usable pattern on scope. Adjust for response similar to Fig. 4. Adjust A15 for maximum amplitude between markers. A15 affects bandpass. A13 affects tilt (when A16 is properly adjusted) and A14 affects the response bandwidth.

ALIGNMENT INSTRUCTIONS (cont)

KRK32D TUNER ALIGNMENT (Cont.)

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12	Connect the probe of a DC VTVM to point ⊕. Common to chassis. Adjust A17 for negative 3 volts at point ⊕. Repeat steps 10 and 11 until proper response is obtained.							
13.		Connect frequency meter as in step 10.	Not used	Freq. meter to 307MC	13	Not used	All	Rotate fine tuning control maximum clockwise. Adjust All for maximum audible beat on frequency meter. SLIGHTLY overshoot the adjustment an additional turn in the same direction, then adjust A8 to again obtain an audible beat.
14.	Two 300Ω Carbon Resistors	Across antenna terminals with 300Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	"	Vert. Amp. to point ⊕. Low side to chassis.	A18, A19	Adjust for response similar to Fig. 4. Turn off generator and check oscillator injection voltage at point ⊕. (Using VTVM as in step 12). If A17 requires readjustment turn sweep generator back on and recheck channel 13 response. If necessary retouch A18 and A19 for desired response.
15.		Connect frequency meter as in step 10.	Not used	Freq. meter to 127MC	8	Not used	A8	Check for audible beat on frequency meter. If necessary adjust A8 for proper oscillator frequency.
16.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	183MC (10MC Swp)	181.25MC 185.75MC	"	Vert. Amp. to point ⊕. Low side to chassis.	A13, A14, A15, A16	If necessary retouch A13, A14, A15 and A16 to obtain response similar to Fig. 4. If A13 required adjustment turn off generator and switch back to channel 13 and check oscillator injection voltage as in step 12. If necessary repeat steps 14, 15 and 16 until proper response is obtained.
17.		Connect freq. meter as in step 10.	Not used	Freq. meter to 129MC	6	Not used	A25	Set fine tuning control to its mid-range position. Adjust A25 for audible beat on frequency meter.
18.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	85MC (10MC Swp)	83.25MC 87.75MC	"	Vert. Amp. to point ⊕. Low side to chassis.	A30, A31, A32	Adjust for response curve similar to Fig. 5. Check oscillator injection voltage as in step12. Readjust A17 if necessary.
19.	If A17 required adjustment switch receiver and generator to channel 8. Readjust A13 for response similar to Fig. 4. Recheck A8 and A9 for proper oscillator frequency as in step 10.							
20.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	85MC (10MC Swp)	83.25MC 87.75MC	6	Vert. Amp. to point ⊕. Low side to chassis.		Check for response similar to Fig. 5. Check oscillator injection voltage for each channel at point ⊕. If markers fall below 50% on any one channel retouch A30, A31 and A32 to obtain response curves within proper limits.
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			
21.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response curve similar to Fig. 5. Check oscillator injection voltage for each channel at point ⊕. If markers fall below 80% on any one channel retouch A14, A15, A16 to obtain response curves within proper limits.
			207MC (10MC Swp)	205.25MC 209.75MC	12			
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
22		Connect frequency meter as in step 10.	Not used	Set freq. meter to 257MC	13	Not used	All	Adjust individual channel oscillator slug for audible beat on each channel. Recheck oscillator injection voltage on each channel at point ⊕. To verify that the voltage is within 2 volts MINIMUM and 5.5 volts MAXIMUM.
				251MC	12		A12	
				245MC	11		A20	
				239MC	10		A21	
				233MC	9		A22	
				227MC	8		A23	
				221MC	7		A24	
				129MC	6		A25	
				123MC	5		A26	
				117MC	4		A27	
				107MC	3		A28	
				101MC	2		A29	

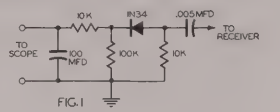


FIG. 1

FIG. 2

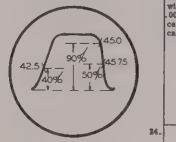


FIG. 3

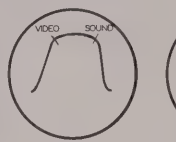


FIG. 4

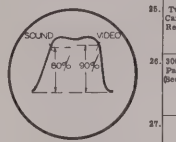


FIG. 5

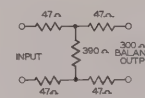


FIG. 6

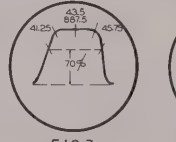


FIG. 7

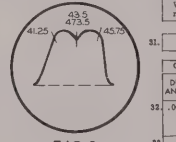


FIG. 8

KRK30C UNIT UHF ALIGNMENT

Turn the change-over switch to UHF position. The tuner may be removed from set for UHF alignment. It is necessary for RF adjustments to remove UHF tuner. The IF and oscillator adjustments may be made without removing UHF tuner.
It will be necessary to fabricate a test dial to fit over the split gear on tuner shaft for accurate alignment.
Reference points at 0, 5, and 184 degrees should be scribed on the test dial. Locate "0" degress reference point by placing a 1/16" shim between the stop pin on the tuner and the stop plate on the gear assembly with the capacitor plate full meshed.
Connect the synchronised sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
23.	1000Ω Carbon Resistor in series with .0015MFD ceramic capacitor	High side to front terminal of UHF crystal holder. Low side to tuner case. Use very short leads.	797MC (20MC Swp)	46.75MC 43.5MC	Between channels 68 and 69	Vert. Amp. thru detector (Fig. 1) to junction of 1000Ω and .0015MFD. See remarks. Low side to chassis.	A33, A34	Set tuner to UHF position. Connect 180Ω in series with .0015MFD ceramic capacitor between point Ⓟ and chassis with capacitor end connected to point Ⓟ. If VHF generator is used couple it loosely to detector (Fig.1). Connect bias supply to point Ⓐ, as in KRK32D Video Alignment. Connect a second bias supply to point Ⓥ. Adjust bias for - 4 volts. Attenuate sweep generator for .5 volts peak to peak on scope. Adjust A33 and A34 for maximum gain as in Fig. 5. Remove 180Ω resistor and .0015MFD capacitor from point Ⓟ and chassis. If necessary adjust A35 to place 45.75MC marker at peak of curve. Adjust A36 for MINIMUM tilt on curve as in Fig. 5.
24.	"	"	"	785.25MC 799.75MC 43.5MC 45.75MC	68	Vert. Amp. to point ⊕. Low side to chassis.		Adjust sweep generator output for 3 volts peak to peak on scope. If necessary, retouch A38, A39 to obtain response similar to Fig. 5. Markers should not fall below 90%.
25.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	44MC (20MC Swp)	42.5MC 45.0MC 45.75MC 46.0MC	Check all channels on VHF	"	A1, A2	Couple marker generator loosely to first video IF amplifier grid. Check for response curve similar to Fig. 5. SLIGHTLY retouch A1 and A2 if necessary to correct for any overall tilt.
26.	300Ω Pad (See Fig. 6)	Across UHF antenna terminals thru 300Ω pad (See Fig. 6).	867.5MC (20MC Swp)	867.5MC 41.25MC 43.5MC 45.75MC	83 (Rotate tuning dial to 164°)	Vert. Amp. to point ⊕. Low side to chassis.	A37, A38	Connect the high side of VHF signal generator thru 1000Ω carbon resistor to rear terminals of UHF crystal holder and insert markers for 41.25MC, 43.5MC and 45.75MC. Adjust for response curve similar to Fig. 7.
27.	"	"	"	"	"	"	A39	Adjust until 43.5MC marker coincides with 867.5MC marker with the 41.25MC and 45.75MC markers symetrically located on response curve as shown in Fig. 7.
28.	"	"	473.5MC (20MC Swp)	473.5MC 41.25MC 43.5MC 45.75MC	14 (Rotate tuning dial to 57°)	"	A40, A41	Adjust A40 until 43.5MC marker coincides with 473.5MC marker and with the 41.25MC and 45.75MC markers as shown. Adjust A41 to bring the oscillator trimmer (A46) within range.
29.	Repeat steps 26, 27 and 28 until proper response are obtained. With perfect tracking the three markers will ride on top of the response curve. The markers may ride down the curve as far as 70% without affecting the alignment. If they fall below the 70% level, knifing of the RF plates is necessary to correct tracking. Two holes are provided on the left side of the tuner thru which the plates may be knifed. The plates should be knifed while tuning the lower frequency. To avoid affecting the tracking above the point of knifing. A check of which section to knife may be made by touching the plates with the knifing tool while observing the response.							
30.	Connect the DC probe of a VTVM to point ⊕. Common to chassis. Set VTVM to 1.5 volts DC scale. Tune over entire UHF range. Readings between .05 volts and .4 volts should be obtained. Voltages outside of these readings indicate low B+ voltage or low or high crystal impedance or oscillator tube outside its allowable limits. Connect the DC probe to point Ⓥ which is tuner bias terminal. Connect common to chassis. VTVM should read .5 volts to 2.5 volts. Readings out of this range will cause crystal currents outside allowable limits and in such cases replacement of the oscillator tube should follow. Recalibrate the high and low frequency bands if oscillator tube is exchanged.							

FM TRAP ADJUSTMENT

31.	Tune in a local TV station in which interference is noticed. Adjust A42 for MINIMUM interference in the picture.							

SOUND IF ALIGNMENT

Ground pin 1 of V5.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
32.	.001MFD	High side to point Ⓘ. Low side to chassis.	4.5MC (Unmod)	Any not used locally	DC probe to point J. Common to chassis.	A45	Adjust for maximum deflection. Peak with core at chassis end.
33	"	"	"	"	"	A43, A44	Adjust for maximum deflection.
34.	"	"	"	"	DC probe to point K. Common to chassis.	A45	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Disconnect generator and VTVM. Tune in a station with good audio and notice if buzz is present. If noticed readjust A45 for MINIMUM buzz and clearest sound.

ALIGNMENT INSTRUCTIONS (cont)

4.5 MC TRAP ADJUSTMENT

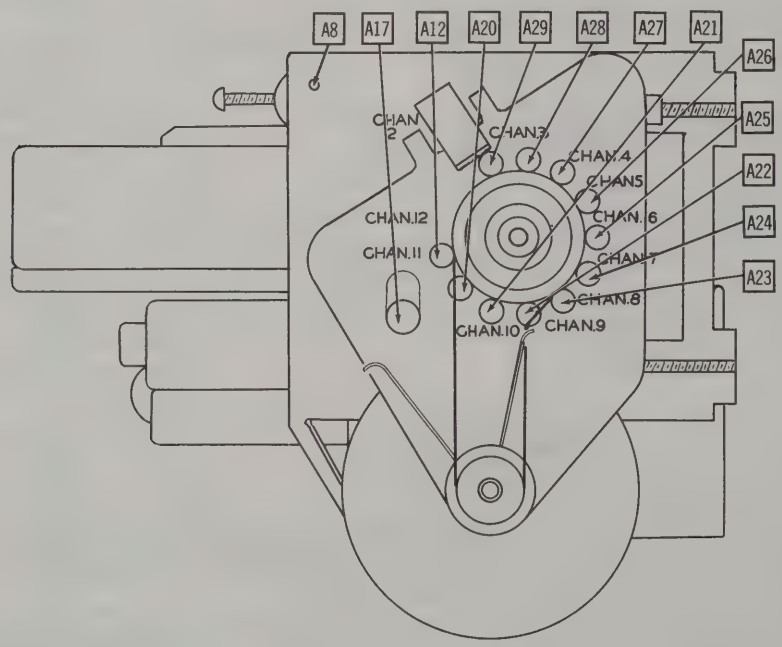
Ground pin 1 of V5.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
35.	.001MFD	High side to point Ⓒ. Low side to chassis.	4.5MC (Unmod)	Any channel not used locally	DC probe thru detector (Fig.1) to point Ⓛ. Common to chassis.	A46	Increase signal generator output for .5 volts on VTVM. Adjust for MINIMUM deflection. Remove ground from pin 1 of V5.

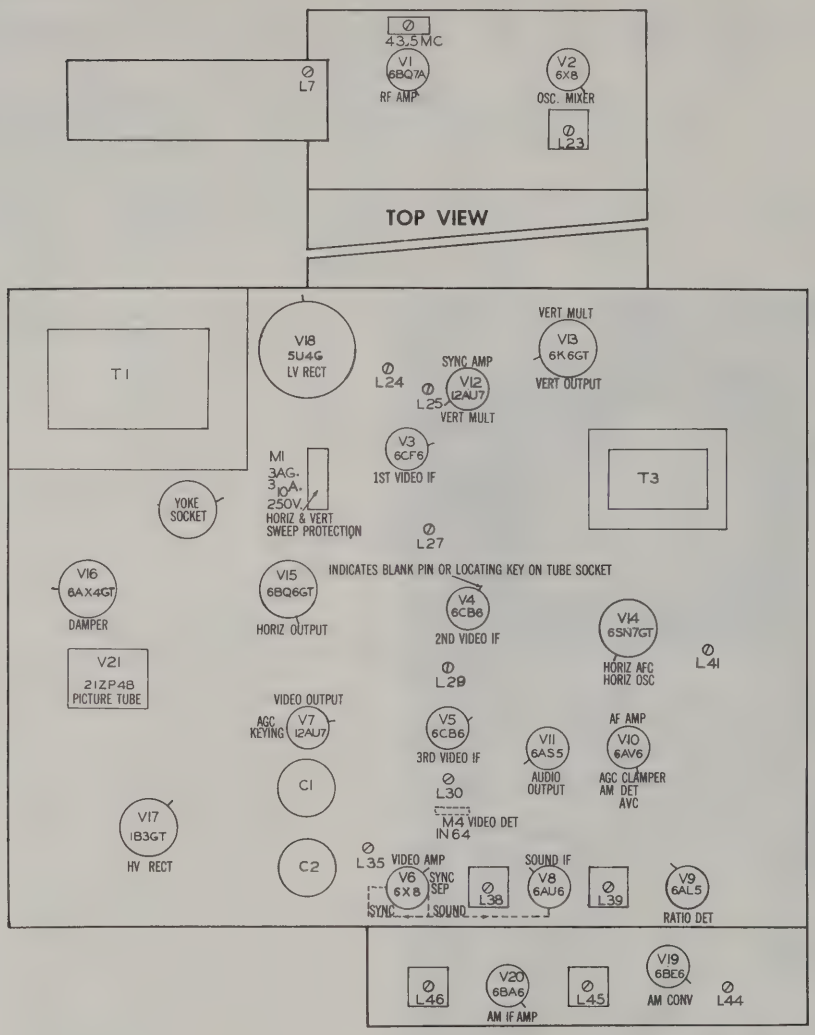
RADIO ALIGNMENT

Use isolation transformer if available. If not connect a .1MFD in series with low side of signal generator and chassis.
Volume control should be set at maximum position.
Output of signal generator should be no higher than necessary to obtain output reading on VTVM.
Set change-over switch to radio position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
36.	.01MFD	High side to point Ⓜ Low side to chassis.	455KC (Mod)	AM	Tuner gang fully open.	Across voice coil of speaker	A47,A48	Adjust for maximum deflection.
37.	"	High side to point Ⓝ Low side to chassis.	"	"	"	"	A49,A50	Adjust for maximum deflection. Retouch A47 and A48.
38.		Loop (L43)	1620KC	"	"	"	A51	Adjust for maximum deflection.
39.		"	1400KC	"	Tune to 1400KC signal	"	A52	"
40.		Not used	600KC	"	Tune to 600KC signal	"	A53	Adjust for maximum while rocking tuner gang. Repeat steps 36, 37 and 38 until no additional gain in sensitivity is obtained.



TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V18**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6, V11**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V7, V21**
Has pic, no sound - **V8, V9, V10, V11**
Overloaded picture - **V7, V10**

SYNC FAILURE
No vert. sync - **V12, V13**
No horiz. sync - **V12, V14**
No vert. or horiz. sync - **V6, V12**

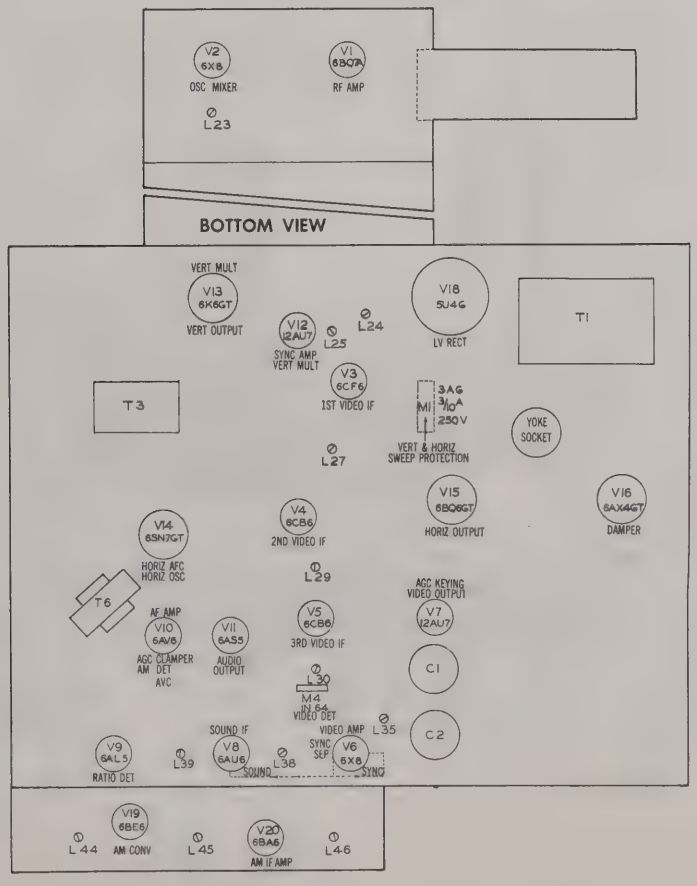
SWEEP FAILURE
No raster, has sound - **V14, V15, V16, V17, V21, Fuse (M1)**
No vertical deflection - **V12, V13**
Poor vert. linearity or foldover - **V12, V13**
Poor horiz. linearity or foldover - **V14, V15, V16**
Narrow picture - **V14, V15, V16, V17, V18**
Vert. off freq. - **V12, V13**
Horiz. off freq. - **V12, V14**

RESISTANCE MEASUREMENTS

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	†1. 9KΩ	†500KΩ	†600KΩ	0Ω	. 1Ω	†600KΩ	270KΩ	120Ω	0Ω
V 2	6X8	0Ω	100KΩ	†13KΩ	. 1Ω	0Ω	0Ω	100KΩ	†16KΩ	†16KΩ
V 3	6CF6	40KΩ	68Ω	0Ω	. 1Ω	▲700Ω	▲700Ω	0Ω		
V 4	6CB6	80KΩ	▲18Ω	0Ω	. 1Ω	†700Ω	†700Ω	INF		
V 5	6CB6	. 2Ω	180Ω	. 1Ω	0Ω	♦500Ω	♦500Ω	0Ω		
V 6	6X8	0Ω	3Meg	♦1. 2Meg	0Ω	. 1Ω	120Ω	3. 9KΩ	♦4. 4KΩ	♦15KΩ
V 7	12AU7	230KΩ	♦25KΩ	♦0Ω	. 1Ω	. 1Ω	†7. 5KΩ	470KΩ	2. 2KΩ	0Ω
V 8	6AU6	47KΩ	0Ω	0Ω	. 1Ω	♦1KΩ	♦1KΩ	120Ω		
V 9	6AL5	100KΩ	100KΩ	. 1Ω	0Ω	10KΩ	0Ω	10KΩ		
V 10	6AV6	10Meg	0Ω	. 1Ω	0Ω	270KΩ	1Meg	†330KΩ		
V 11	6AS5	15KΩ	500KΩ	. 1Ω	0Ω	500KΩ	†2. 7KΩ	†3. 1KΩ		
V 12	12AU7	♦14KΩ	33KΩ	1. 2KΩ	. 1Ω	. 1Ω	▲2Meg	1. 8Meg	0Ω	0Ω
V 13	6K6GT	INF	0Ω	†600Ω	†38Ω	1. 4Meg	INF	. 1Ω	0Ω	
V 14	6SN7GT	1. 4Meg	†38Ω	240KΩ	250KΩ	†45KΩ	0Ω	. 1Ω	0Ω	
V 15	6BQ6GT	INF	. 1Ω	100Ω	12KΩ	1Meg	0Ω	0Ω	100Ω	Top Cap ▲21Ω
V 16	6AX4GT	INF	INF	1Meg	INF	†38Ω	INF	. 1Ω	0Ω	
V 17	1B3GT		PINS	1 - 8	HAVE	INFINITE	RESISTANCE			Top Cap ▲400Ω
V 18	5U4G	INF	60KΩ	INF	26Ω	INF	24Ω	INF	60KΩ	
V 19	6BE6	33KΩ	. 7Ω	†0Ω	. 1Ω	¶4. 7KΩ	¶4. 7KΩ			
V 20	6BA6	4Meg	0Ω	. 1Ω	†0Ω	¶3. 3KΩ	¶3. 3KΩ			
V 21	21ZP4B	0Ω	470KΩ	Pin 10 ▲320KΩ	Pin 11 †220KΩ	Pin 12 . 1Ω				

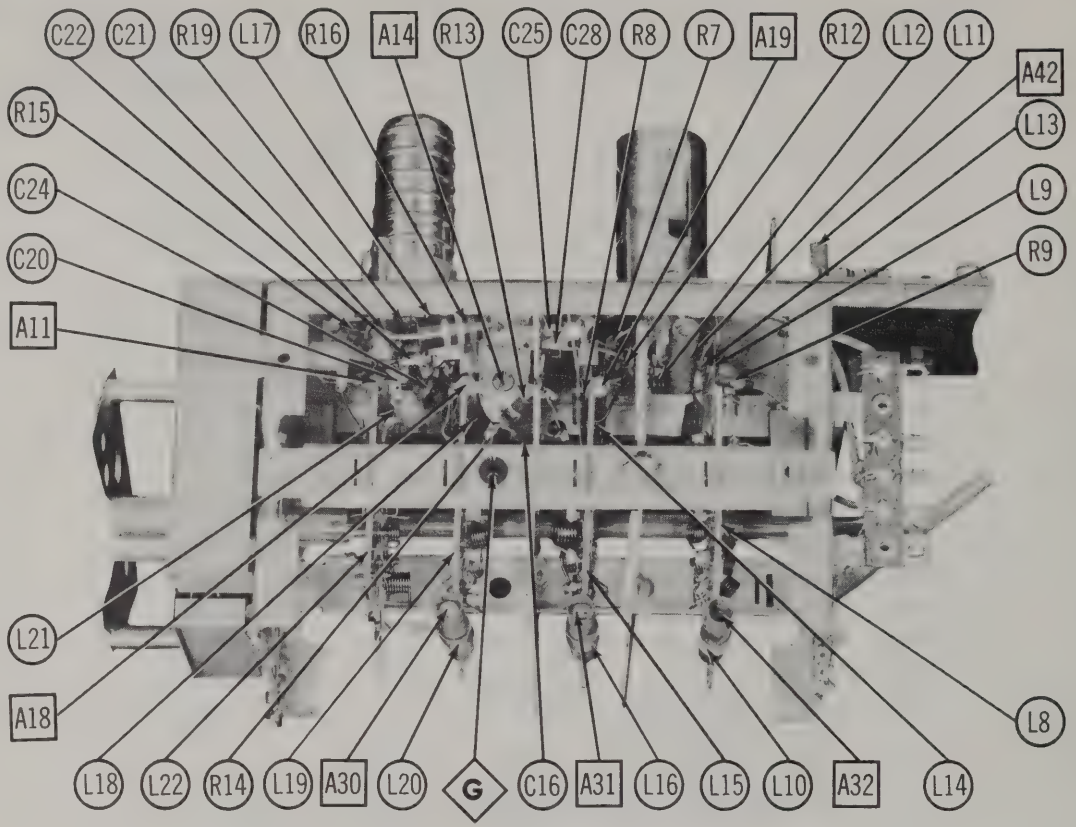
† MEASURED FROM PIN 2 OF V18
▲ MEASURED FROM PIN 7 OF V4
♦ MEASURED FROM 145V LINE. (TV POSITION)
▲ MEASURED FROM PIN 3 OF V16
† MEASURED IN "RADIO" POSITION
¶ MEASURED FROM 145V LINE. (RADIO POSITION)
ALL MEASUREMENTS TAKEN IN "TV" POSITION UNLESS OTHERWISE DESIGNATED.



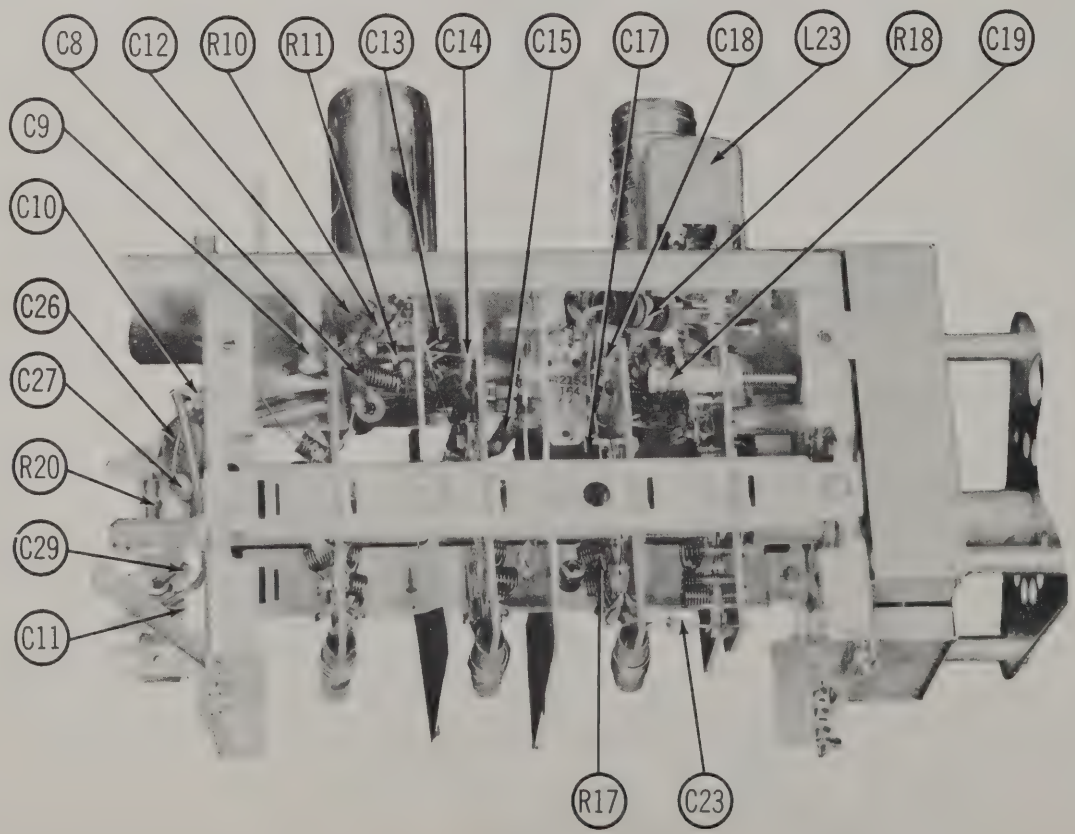
TUBE PLACEMENT CHART

SET 279 FOLDER 13

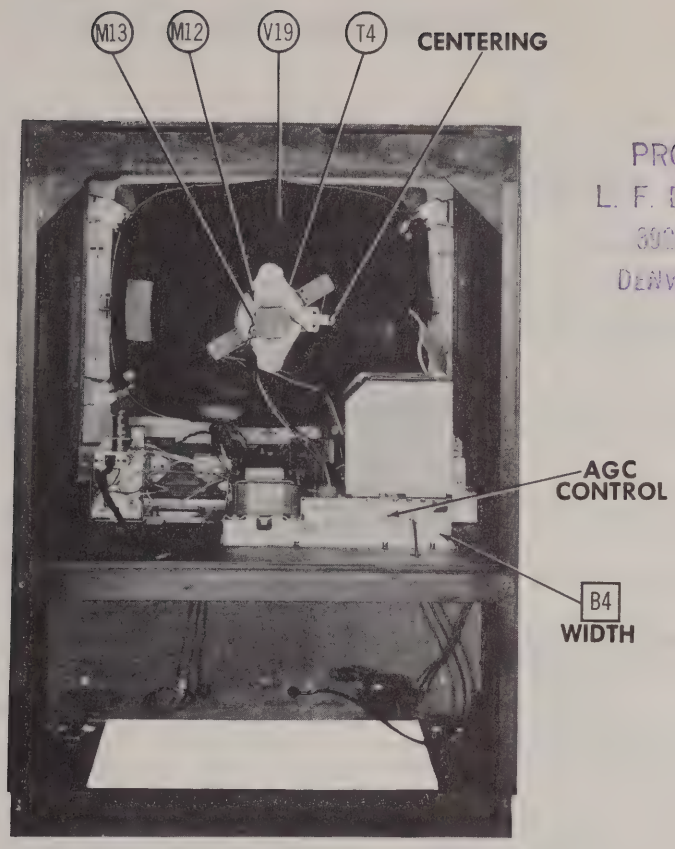
RCA VICTOR MODELS 21-S-548, U
(Ch. KCS88N, P & Radio Tuner Ch. RK191)



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

If the picture cannot be synchronized horizontally adjust horizontal frequency slug (B1) until picture synchronizes.

If picture still will not synchronize adjust the horizontal waveform slug (B2) several turns out of the coil and readjust B1 to synchronize the picture.

If picture width or linearity is incorrect adjust the horizontal drive (B3), the width slug (B4) for proper results.

HORIZONTAL WAVEFORM ADJUSTMENTS

The horizontal waveform adjustment is adjusted at the factory and normally will require no readjustment. If B1 or B2 are replaced in set scope adjustment will be necessary to synchronize the picture. Short out slug (B2) with clip leads and turn B1 slug all the way out. Rotate B1 slug back in until picture locks in sync. Remove short from B2. Connect the low capacity probe of an oscilloscope to terminal point ◇ on schematic. Low side to chassis. Adjust B2 until the waveform on scope appears as in Fig. 9.

AGC CONTROL ADJUSTMENT

Connect the vertical amp. of an oscilloscope to pin 6 of V7. Connect the low side to chassis. Turn AGC control fully counter clockwise. Tune in a strong TV station and adjust scope to see the video waveform. Turn AGC control clockwise until sync tips begin to become compressed, then back just enough to remove compression. If the control is set too far clockwise on a weak signal the receiver may overload when receiving a strong signal.

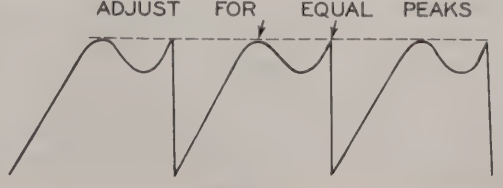


FIG. 9

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss Of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V15, V16 and V18. Check adjustments B3 and B4. Check R113, R112, R109, C99, C102 and other associated components. Check T2 and T4A.

DRIVE LINES

Check by substitution V15 and V16. Check adjustment B3. Check C102, C104, R112, R113, T2 and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V15 and V16. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V14, V15 and V16. Check C96, C97, R101 for open. Check L40, L41, C94, C99, C98, R107 and other associated components.

XMAS TREE EFFECT

Check by substitution V14, V15 and V16. Check T2 and T4 for internal arcing. Check C94, C98, C99, C102, R109, R102 and other associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V12 and V13. Check waveform W9.

If Satisfactory	If Unsatisfactory
Check T3, T4B and other associated components.	Check C81, C85, R2, R85, R94 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V12 and V13. Check height and vertical linearity controls for proper operation. Check R85, C82, T3 and other associated components.

COMPRESSED AT BOTTOM

Check by substitution V12 and V13. Check C81, C85, R2, R85 and other associated components.

COMPRESSED AT TOP

Check by substitution V12 and V13. Check R94, R4, C85, T3 and other associated components.

FOLDS

Check by substitution V12 and V13. Check C83, C84, C86, C85, R91, R92, and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC.

Check by substitution V6 and V12. Check C72, C73, C74, C76, R72, R76, R81, R82 and other associated components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Substitution V12. Check vertical integrator network. Check R5 and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Substitute V14. Check C92, C93, C98, R107, R101 and other associated components.

HORIZONTAL BENDING

Check by substitution V6, V12 and V14. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Check by substitution V6 and V7. Check R37, R42, L36, C49, C50, C1B and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustment A46. Check video IF Alignment.

POOR CONTRAST

Check by substitution V6 and V7. Check L32, L33, L34, L37, C49, C50 and other associated components.

NEGATIVE PICTURE

Check by substitution V6 and V7. Check picture tube. Check L31, L32, C49, C50 and R41. Check video IF alignment.

SMEAR

Check by substitution V6 and V7. Check L31, L32, L33, L34, L37, C49, C50 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V1, V3, V4, V5, V6 and V7 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V8, V9, V10 and V11. Check stages V10 and V11 using audio signal generator. Apply audio signal across R1B.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF stages for component failure or change of value.	Check C64, C67, C70, C71, C3, R64, R70, T6 speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A45 for minimum buzz. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak Or No Sound".

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly. Check switch on volume control and T1. If filaments light, check TV-Phono switch for TV position. Substitute V18. Check B+ filter and decoupling network.

SMALL AND/OR DIM PICTURE

Substitue V18. Check B+ filter and decoupling network.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		RCA Victor PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BQ7A	6BQ7A	9AJ	
V2	Osc.-Mixer	6X8	6X8	9AK	
V3	1st. Video IF Amp.	6CF6	6CF6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Amplifier-Sync Separator	6X8	6X8	9AK	
V7	Video Output-AGC Keying	12AU7	12AU7	9A	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Ratio Detector	6AL5	6AL5	6BT	
V10	AF Amp.-AGC Clamper-AM Det.-AVC	6AV6	6AV6	7BT	
V11	Audio Output	6AS5	6AS5	7CV	
V12	Sync Amplifier-Vert. Mult.	12AU7	12AU7	9A	
V13	Vert. Mult.-Vert. Output	6K6GT	6K6GT	7S	
V14	Horiz. AFC-Horiz. Osc.	6SN7GT	6SN7GT	8BD	
V15	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V16	Damper	6AX4GT	6AX4GT	4CG	
V17	HV Rectifier	1B3GT	1B3GT	3C	
V18	LV Rectifier	5U4G	5U4G	5T	
V19	AM Converter	6BE6	6BE6	7CH	
V20	AM IF Amp.	6BA6	6BA6	7BK	

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CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA					RETMA BASE TYPE	NOTES
	RCA Victor PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.		
V21	21ZP4B ①	21ZP4B ① 21ZP4A	21ZP4B ① 21ZP4A	21ZP4B ① 21ZP4A 21ZP4 ②	21ZP4B ① 21ZP4A	12N 12N 12D	① Aluminized ② Circuit changes necessary

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	RCA Victor PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	▲80	400	79147			FP375.5	TM-D80-450	Q-065	
B	▲80	200							
C2A	▲100	400	79146			FP247	TM-100-450	S-285	
B	▲30	50					TD-50-50	FM-0550	
C3	100	250	79314			FP129.1	TD-100-450	S-190	
C4	18			TCZ-18	801-180NP0	ZT-5418			
C5	5			TCZ-5	831-050NP0	ZT-555			
C6	27			TCZ-27	811-270NP0	ZT-5427		K-1347	
C7	33			TCZ-33	NP0K-330	ZT-5433	IMP2-P47	3302047	
C8	270		75199	D6-271	GP2K-271	UC-5327		K-1347	
C9	1-4		76532	829-4	3115-01-10	CT551		K-1210	
C10	1000		77084	MFT-1000				K-1347	
C11	470		77293	D6-471	831-471	UC-5347		K-1347	
C12	1000		77252	DD-102	801-001	DC-521		K-1210	
C13	1000		77252	DD-102	801-001	DC-521		K-1210	
C14	1-4		76532	829-4	3115-01-10	CT551		3306039	
C15	270		75199	D6-271	GP2K-271	UC-5327			
C16	270		75199	D6-271	GP2K-271	UC-5327			
C17	470		75198	D6-471	GP2K-471	UC-5347			
C18	.8-3		77151	829-3	3115-01-0R5	CT565A			
C19	.8-3		77913						
C20	10		77865	TCZ-10	NP0K-100	ZT-541			
C21	.8-3		77151	829-3	3115-01-0R5	CT565A			
C22	10		33098	TCN-10	N750K-100	NT-541			
C23	.68		71504	TCZ-.68	NP0A-0R68				
C24	1000		77252	DD-102	801-001	DC-521			
C25	1000		77084	MFT-1000					
C26	10000		73960	DD-103	811-01	DC-511			
C27	470		77293	D6-471	831-471	UC-5347			
C28	1000		77084	MFT-1000					
C29	470		77293	D6-471	831-471	UC-5347			
C30	15		39044	TCN-15	N750K-150	NT-5415			
C31	470		77293	D6-471	831-471	UC-5347			
C32	.47	200	73787			PT4047			
C33	470		78622	D6-471	831-471	UC-5347			
C34	1000		77252	DD-102	801-001	DC-521			
C35	470		77293	D6-471	831-471	UC-5347			
C36	470		78622	D6-471	831-471	UC-5347			
C37	1000		77252	DD-102	801-001	DC-521			
C38	1000		77252	DD-102	801-001	DC-521			
C39	.39	200	79318						
C40	470		77293	D6-471	831-471	UC-5347		K-1347	Note 1
C41	1000		78623	DD-102	801-001	DC-521		K-1210	
C42A	1000			DD2-102	812-001	DCD-521		K-1210	Note 3
B	1000							K-1210	Note 3
C43	470		77293	D6-471	831-471	UC-5347		K-1347	
C44	8								Note 2
C45	10		33098	TCN-10	N750K-100	NT-541			
C46	.0039	400	79018	D6-392	GP2-333-392	PT624	IMP6-D4	3306239	
C47	47		39042	D6-470	GP1K-470	UC-5447		K-1447	
C48	6		77364						
C49	.1	600	79149	DF-104		PT601	IMP6-P1	330601	
C50	.1	600	73557	DF-104		PT601	IMP6-P1	330601	
C51	100		39396	TCN-100	N750L-101	NT-531			
C52	120	3500	79708	DD30-121				K-4312	
C53	330	1000	76476	DD30-331	IR5KV-331			K-2333	
C54	.047	600	73592	DF-503		PT6147	IMP6-S47	3306147	
C55	.0022	600	73595	D6-222	GP2-333-222	PT6222	IMP6-D22	3306222	
C56	.33	200	76994					3306033	

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PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA RCA Victor PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	NOTES
C57	3		76507						
C58	39		79233						
C59	56		79234		D6-560	GP1K-560	UC-5456	K-1456	
C60	10000		73960		DD-103	811-01	DC-511		
C61	.47	200	79145				PT4047	IMP3-P47	3302047
C62	1000	500	79053		D6-102	GP2L-102	MC252		K-1310
C63	.0033	400	79315		D6-332	GP2-332-332	PT6323	IMP6-D33	3306323
C64	.01	200	79014		D6-103	GP2-333-103	PT411	IMP4-S1	330411
C65	.0033	400	79315		D6-332	GP2-332-332	PT6323	IMP6-D33	3306323
C66	.01	200	79316		D6-103	GP2-333-103	PT411	IMP4-S1	330411
C67	.01	200	79014		D6-103	GP2-333-103	PT411	IMP4-S1	330411
C68	.0027	500	79199		D6-272	GP2-332-272	MC247	IMP6-D3	3306227
C69	270				D6-271	GP2K-271	UC-5327		K-1327
C70	.0027	600	73599		D6-272	GP2-332-272	UC-5237	IMP6-D3	3306227
C71	.0082	1000	73808				CT10-D82		
C72	.1	400	73581		DF-104		PT401	IMP4-P1	330401
C73	330	500							KM-1333
C74	330	500	39640						KM-1333
C75	.001	400			D6-102	GP2L-102	PT621	IMP6-D1	330621
C76	.033	400	73552				PT6323	IMP6-D33	3306323
C77	470		79622		D6-471	831-471	UC-5347		K-1347
C78	.0082	400	73919					CT10-D83	3306383
C79	.0033	400	73315		D6-332	GP2-332-332	PT6323	IMP6-D33	3306323
C80	.0039	600	78231				MC6463		CM-1239
C81	.01	600	73594		D6-103	GP2-333-103	IMP6-S1		330611
C82	.1	400	73581		DF-104		PT401	IMP4-P1	330401
C83	.056	600	79317						3306156
C84	.068	200	79018					IMP6-S68	3306268
C85	.022	600	73798		DF-203	817-02	PT6122	IMP6-S22	3306122
C86	.0033	600	73565						CM-1233
C87	.015	400	73797						
C88	.022	600	73798		DF-203	817-02	PT6122	IMP6-S22	3306122
C89	.001	1600	78950		DD6-102	837-102	PT631	CT6-D1	3106-001
C90	.022	600	73798		DF-203	817-02	PT6122	IMP6-S22	3306122
C91	.1	400	73581		DF-104		PT401	IMP4-P1	330401
C92	220	500	58271		D6-221	GP2K-221	MC240		K-1322
C93	68	1000	78474						
C94	68	1000	78475						
C95	.1	400	73581		DF-104		PT401	IMP4-P1	330401
C96	.022	400	73563		DF-203	817-02	PT4123	IMP4-S22	3304123
C97	.47	200	73797				PT4047	IMP3-P47	3303047
C98	330	1000	78476						
C99	.01	600	73594						
C100	.1	600	73557		DF-104		PT601	IMP6-P1	330601
C101	.0012	500	76995						CM-1213
C102	470	1000	79607		DD6-471	1R5KV-471	MC245		K-3247
C103	.1	600	73557		DF-104		PT601	IMP6-P1	330601
C104	.27	300	73795						3306027
C105	270	1000	79022		DD6-271	1R5KV-271			K-3327
C106	.047	1000	73597				CT10-S5		2110.05
C107	91								
C108	.01	600			D6-103	GP2-333-103	PT611	IMP6-S1	330611	Note 1
C109	.047	400	73553		DF-503		PT4147		
C110	56		75784		D6-560	GP1K-560	UC-5456		
C111	4.7		77471						
C112	4700		73473		DD-503	811-005	DC-525		
C113	4700		73473		DD-503	811-005	DC-529		
C114	180		79525		D6-181	GP2K-181	UC-5316		
C115	1000		75618		D6-102	GP2L-102	UC-531		

Note 1. Not used in some versions.
Note 2. Some versions use 7MMF in this application (part #79704).
Note 3. In some versions, C42A and C42B are separate units.
Note 4. Some versions use 470MMF in this application.

CONTROLS

ITEM No.	RESISTANCE	WATTS	REPLACEMENT DATA RCA Victor PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	10KΩ	½	79707					Picture - Phase
B	1Meg	½						Volume & Switch tapped at 250KΩ - Rear
R2A	3.5Meg	½	78806	B1L-141	A47-4Meg-S	AB-86	SU-59	Height
B	Shaft		Not Req.	T1M-3K1T	K53-3	AK-1	Not Req.	Attach to R1A
R3A	3.005Ω	½	79139	Q1L-129	A47-200K-S	AB-46	SU-65	Brightness
B	Shaft		Not Req.	Not Req.	K53-3	AK-4	Not Req.	Attach to R3A
R4A	2.5Meg	½	78807	B1L-219	A47-2.5Meg-S	AB-83	SU-565	Vert. Linearity
B	Shaft		Not Req.	T1M-3K1T	FK3-1/4	AK-1	Not Req.	Attach to R4A
R5A	1.5Meg	½	78810	Q1L-138	A47-1.5Meg-S	AB-75	U-155	Vert. Hold
B	Shaft		Not Req.	Not Req.	K53-3	AK-4	Not Req.	Attach to R5A
R6A	600KΩ	½	78808	B1L-133	A47-500K-S	AB-89	SU-50	AGC
B	Shaft		Not Req.	T1M-3K1T	FK3-1/4	AK-1	Not Req.	Attach to R6A

RESISTORS

ITEM No.	RATING OHMS	WATT	REPLACEMENT DATA RCA Victor PART No.	IRC PART No.	NOTES
R7	1Meg	½		BTS-1Meg	
R8	1000Ω	½		BTS-1000	
R9	5900Ω	½		BTS-5900	
R10	130Ω	½		BTS-120	
R11	100KΩ	½		BTS-100K	
R12	1Meg	½		BTS-1Meg	
R13	100KΩ	½		BTS-100K	
R14	100KΩ	½		BTS-100K	
R15	100KΩ	½		BTS-100K	
R16	12KΩ	2		BTS-12K	
R17	3300Ω	½		BTS-3300	
R18	15KΩ	3		BTB-15K	
R19	130Ω	3		BTB-120	
R20	82KΩ	3		BTB-820	
R21	1000Ω	½	502210	BTS-1000	
R22	1000Ω	½		BTS-1000	
R23	47KΩ 5%	½	502247	BTS-47K 5%	
R24	15KΩ	½	56714	BTS-15K	
R25	680 5%	½	502068	BTS-68 5%	
R26	680Ω	½	502168	BTS-680	
R27	56KΩ 5%	½		BTS-56K 5%	Note 1
R28	150KΩ 5%	½	502415	BTS-150K 5%	
R29	150KΩ 5%	½	502415	BTS-150K 5%	Note 1
R30	180 5%	½	33568	BTS-18 5%	
R31	680Ω	½	502168	BTS-680	
R32	56KΩ 5%	½		BTS-56K 5%	Note 1
R33	180Ω 5%	½	502118	BTS-180 5%	
R34	470Ω	½	502147	BTS-470	
R35	3900Ω 5%	½	502239	BTS-3900 5%	
R36	120Ω	½	502112	BTS-120	

RESISTORS (cont)

ITEM No.	RATING OHMS	WATT	REPLACEMENT DATA RCA Victor PART No.	IRC PART No.	NOTES
R37	4700Ω	1	502247	BTS-4700	
R38	15KΩ	1	513212	BTA-15K	
R39	15KΩ	3	513212	BTB-15K	
R40	470KΩ	1	502447	BTS-470K	
R41	82KΩ	2	502182	BTS-820	
R42	75000 5%	½	512278	BTA-7500 5%	
R43	470KΩ	½	502447	BTS-470K	
R44	33KΩ	½	502333	BTS-33K	
R45	56KΩ	½	502382	BTS-56K	
R46	47KΩ	½	502347	BTS-47K	
R47	47KΩ	3	64311	BTB-47K	
R48	110KΩ 5%	½	2723	BTS-110K 5%	
R49	150KΩ 5%	½	502415	BTS-150K 5%	
R50	120KΩ 5%	½	30180	BTS-120K 5%	
R51	1.5Meg 5%	½	502518	BTS-1.5Meg 5%	
R52	33KΩ	½	502332	BTS-33K	
R53	47KΩ	½	502347	BTS-47K	
R54	13KΩ	½	502113	BTS-130	
R55	1000Ω	½	502210	BTS-1000	
R56	39KΩ	½	502339	BTS-39K	
R57	47KΩ	½	64311	BTB-47K	
R58	10KΩ 5%	½	502310	BTS-10K 5%	
R59	10KΩ 5%	½	502310	BTS-10K 5%	
R60	18KΩ	½	502318	BTS-18K	
R61	1.8Meg	½	11769	BTS-1.8Meg	
R62	33KΩ	½	502332	BTS-33K	
R63	10Meg	½	502510	BTS-10Meg	
R64	330KΩ	½	502433	BTS-330K	
R65	820KΩ 5%	½	502482	BTS-820K 5%	
R66	680KΩ 5%	½	3066	BTS-680K 5%	
R67	330KΩ 5%	½	502433	BTS-330K 5%	
R68	22KΩ	2	532223	BTB-22K	
R69	18KΩ	2	532218	BTB-18K	
R70	47KΩ	2	532147	BTB-47K	
R71	22000	½	502322	BTS-2200	
R72	18KΩ 5%	½	3219	BTS-18K 5%	
R73	270KΩ	½		BTS-270K	
R74	1.5Meg	½		BTS-1.5Meg	
R75	1.5Meg	½		BTS-1.5Meg	
R76	33KΩ	½	502339	BTS-39K	
R77	1.35Meg	½	502513	BTS-1.35Meg	
R78	33KΩ	½	502333	BTS-33K	
R79	390KΩ	½	502439	BTS-390K	
R80	1200Ω	½	502312	BTS-1200	
R81	10KΩ	1	513210	BTA-10K	
R82	39000 5%	½	502339	BTS-3900 5%	
R83	22KΩ	½	502322	BTS-22K	
R84	18KΩ 5%	½	3219	BTS-18K 5%	
R85	470KΩ	½	502447	BTS-470K	
R86	270KΩ	½	502427	BTS-270K	
R87	33KΩ	½	502332	BTS-33K	
R88	33KΩ 5%	½	502333	BTS-33K 5%	
R89	22KΩ 5%	½	502232	BTS-22K 5%	
R90	18KΩ 5%	½	3219	BTS-18K 5%	
R91	8200Ω	½	502282	BTS-8200	
R92	390KΩ	½	502439	BTS-390K	
R93	470KΩ	½	502447	BTS-470K	
R94	680KΩ 5%	½	30562	BTS-680K 5%	
R95	220KΩ	½	502422	BTS-220K	
R96	150KΩ	½	502415	BTS-150K	
R97	560Ω	½		BTS-560	
R98	560Ω	½		BTS-560	
R99	150KΩ 5%	½	502415	BTS-150K 5%	
R100	680KΩ	½	502468	BTS-680K	
R101	3900Ω	½	502329	BTS-3900	
R102	330KΩ	½	502433	BTS-330K	
R103	82KΩ 5%	½	502382	BTS-82K 5%	
R104	100KΩ 5%	1	512410	BTA-100K 5%	
R105	6.8Meg	½	32071	BTS-6.8Meg	
R106	180KΩ	½	502418	BTS-180K	
R107	47KΩ	½	502347	BTS-47K	
R108	820KΩ	½	502482	BTS-820K	
R109	39KΩ	1	73084	BTA-39K	
R110	47Ω	½	502047	BTS-47	
R111	1Meg	½	502810	BTS-1Meg	
R112	100Ω	2	76018		
R113	12KΩ	2	532213	BTB-12K	
R114	56KΩ	½	502356	BTS-56K	
R115	1000Ω	½		BTS-1000	
R116	500Ω	10	79708	PW10-500	
R117	100KΩ	½	502410	BTS-100K	
R118	820KΩ 5%	½	502482	BTS-820K 5%	
R119	1.5Meg	½	31449	BTS-1.5Meg	
R120	33KΩ	½	502339	BTS-33K	
R121	10KΩ	½	502110	BTS-10K	
R122	470KΩ	½	502247	BTS-4700	
R123	100Ω	½	502110	BTS-100	
R124	3300Ω	½	502333	BTS-3300	
R125	47KΩ	½	502347	BTS-47K	
R126	330KΩ	½	502433	BTS-330K	
R127	560KΩ	½	502456	BTS-560K	
R128	3.3Meg	½	502533	BTS-3.3Meg	

Note 1. Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA RCA Victor PART No	Stancor PART No	Merit PART No	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC	564VCT	5VAC	79706			H-63BC①		P8723	
	② 1.4A	300ADC	③ 3A							
		SEC. 3	SEC. 4	SEC. 5						
		6.3VAC								
		④ 5.5A								

① Parallel and phase 6.3V ④ 5A winding for sec. #3, taps 6.3V ⑤ 1.2A winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA RCA Victor PART No	Halldorson PART No.	Merit PART No.	RCA PART No.	Ram PART No.	Stancor TYPE No.	Thordarson PART No.	Triad PART No.
T2	Horiz. Output Trans.	78145	F34H ①	RV0-9* ①		X080* ①	A-8233* ①	F1L-Y-24* ①	D-12* ①
T3	Vert. Output Trans.	79143	21H03 ② ③	A-30362 ② ③		W307 ② ③	A-8145 ② ③	T26T72 ② ③	A-108X ② ③
T4A	Yoke-Horiz. (3.5MH)	77897 ④	DF802 ④	MDF-73 ④		T70P14/43	DY-8A ④	Y-7 ④	Y-17 ① ④
B	Vert. (39MH)					20J816			
T5	Width (2.7 - 17MH)	78144	RF800 ⑤ ⑥	MWC-50 ⑤			WC-8	WC-16 ⑤ ⑥	WC-12 ⑤ ⑥

① Drill new mounting hole(s).
② Connect as auto transformer.
③ Mount on inner bracket.
④ Use original mounting bracket.
⑤ Includes C107, R97, R98 and R115.
⑥ See instructions packed with unit pertaining to yoke damping network.
⑦ Connect horiz. network across terminals #3 & #7. Use original network, if necessary.
⑧ Remove damping capacitor across terminals #1 & #2. Use original network, if necessary.
⑨ Connect new yoke network the same as in original circuit. Use original network, if necessary.
⑩ Enlarge mounting hole.
⑪ Connect to coded #1 & #2 terminals.
⑫ Connect to coded blue & red terminals.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
5	9	9		9	7	9	9
4	8	8		7 & 8	6	8	7 & 8
3	5	5		5	5	5	5
2	3	3		3	4	3	3
1	1	1		1	3	1	1
Connect Width Coil Across	2 & 1	3 & 1		3 & 1	3 & 4	3 & 1	3 & 1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	SEC.	REPLACEMENT DATA RCA Victor PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T6	4.3KΩ	3.7Ω	78150	A-3649	A-3019	S-5Z	S1006	26S90 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V C IMP	REPLACEMENT DATA RCA Victor PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	8"	PM	3.7Ω	74664	ST-115 Mod. PR-V	8A21	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Matching Trans.	.6Ω	.6Ω	78396				Note 1
L2	Ant. Matching Trans.	.6Ω	.8Ω	78396				Note 1
L3	IF Trap	0Ω		78396				Note 1
L4	Ant.Shunt Coil	0Ω		78396				Note 1
L5	Ant. Shunt Coil	0Ω		78396				Note 1
L6	IF Trap	0Ω		78396				Note 1
L7	FM Trap	0Ω		78396				Note 1
L8	Ant. Coils	0Ω		78803				Channel 13, part of complete assembly Includes stator complete with rotor, coils (also L9 and L10)
L9	Ant. Coil	0Ω		78803				Channel 13, part of complete assembly Channel 6, part of complete assembly
L10	Ant. Coil	0Ω		78803				Channel 13, part of complete assembly Channel 6, part of complete assembly
L11	Fil. Choke	0Ω		77306				
L12	Mext. Coil	0Ω		76563				
L13	IF Trap Coil	0Ω		78466				
L14	RF Coil	0Ω		78801				Channel 13, part of complete assembly Includes stator complete with rotor, coils, resistors, caps (Also L15, L16).
L15	RF Coils	0Ω		78801				Channel 6, part of complete assembly Includes stator complete with rotor coils (Also L14). cap. & trimmer includes 27KΩ resistor
L16	RF Coil	0Ω		78801				
L17	Fil. Choke	0Ω		79067				
L18	Mixer Grid Coil	0Ω		78800				Channel 13, part of complete assembly
L19	Mixer Grid Coils	0Ω		78800				Includes stator complete with rotor, coils, resistors, caps (Also L18, L20)
L20	Mixer Grid Coil	0Ω		78800				Channel 6, part of complete assembly
L21	Osc. Coil	0Ω		79068				Channel 6, part of complete assembly Includes stator complete with rotor coils (Also L22). cap. & trimmer includes 27KΩ resistor
L22	Osc. Coils	0Ω		79068				
L23	Conv. Plate	.8Ω	.6Ω	78399				
L24	47.25MC Trap	.1Ω		78804			6319 ⊕	
L25	Int.Video IF	0Ω	.3Ω	78808	17-4523		6319	
L26	Fil. Choke	0Ω			19-1000	TV-189	6808	1 Microhenry
L27	2nd.Video IF	.2Ω	.9Ω	78433	17-4522		6319	
L28	Fil. Choke	0Ω			19-1000	TV-189	6808	1 Microhenry
L29	3rd.Video IF	.2Ω	.2Ω	78433	17-4523		6219	
L30	4th.Video IF	.2Ω	.2Ω	78433	17-4524		6219	
L31	Series Peaking Coil	2.9Ω		76011	19-3026	TV-180	6176	36 Microhenries
L32	Shunt Peaking Coil	1Ω		71526	19-3250	TV-185	6181	250 Microhenries
L33	Series Peaking Coil	7.5Ω		77574	19-3250 ⊕	TV-185 ⊕	6181 ⊕	250 Microhenries, wound on 27KΩ resistor
L34	Shunt Peaking Coil	8.5Ω		79321	19-3250 ▲	TV-185 ▲	6181 ▲	250 Microhenries, wound on 10KΩ resistor
L35	4.5MC Trap	7Ω		79157	17-3403 ⊕		1470	
L36	Shunt Peaking Coil	17Ω		75353	19-3500	TV-188	6174	500 Microhenries
L37	Series Peaking Coil	6.5Ω		78336	19-4180	TV-188	6179	180 Microhenries, wound on 39KΩ resistor
L38	Sound IF	3.5Ω		78540	18-5445 ⊕	TV-1B ⊕	6303 ⊕	
L39	Ratio Detector	19.5Ω	.8QCT	78541	17-3497 ⊕	TV-1B ⊕	6308 ⊕	Tertiary winding -.3Ω
L40	Horiz. Osc.	77Ω		79534	30-1403 †	TV-162 †	6182 †	Tapped @ 5kΩ
L41	Horiz. Phase	46Ω		79541	30-1402 †	TV-162 †	6183 †	
L42	RF Choke	.75Ω		79540	19-2001		6004	1.5 Microhenries, IRC part #CL-1
L43	Ant. Coil	.4Ω		79538				
L44	Osc. Coil	.7Ω	5Ω	79057	14-1974 ⊕	BC-381 ††		71-C8C
L45	Input IF	16Ω	16Ω	78486	18-4788	BC-353		12-C1
L46	Output IF	16Ω	16Ω	79537	18-4789	BC-353		12-C3

Note 1. Complete antenna matching transformer part #78396. Includes L1, L2, L3, L4, L5, C4, C5, C6 and C7.
* Use one winding only.
⊕ Parallel with 27KΩ resistor.
▲ Parallel with 10KΩ resistor.
◆ Do not use trap winding.
◆ Terminals sufficient mounting support.
† Replaces horizontal oscillator and horizontal phase coil. Cut out chassis hole and drill mounting holes.
†† Leads sufficient mounting support.
†† Drill mounting hole.

RCA VICTOR MODELS 21-S-548, U (Ch. KCS88N, P & Radio Tuner Ch. RK191)

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	RCA Victor PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L47	.200A	38Ω	1.3HY	77676	C-2326①	C-2996①	C-23X①	C5037①	26C44①

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			RCA Victor PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	3/10A 250V	79214	78218	312.300 (3AG-3/10A)	357001	AGC 3/10	4405

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	RCA Victor PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2	77779			46	0-1 or S-1 & 0-3	

ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	RCA Victor PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M3	(75497) (78 Needle)	†M-74 and	*C-436 or †C-401 or ♦C-401D and	†W-44S and	* Metal † Jewel ♦ Diamond
	(77899) (33 1/3-45 Needle)	†M-74LP	*A-437 or †A-435 or ♦A-435D	†W-44MGS	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		RCA Victor PART No.	SYLVANIA PART No.		
M4	1N64	76675	1N60 or 1N132		Video Det.

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M5	Dial Light		Channel Ind. #44, Bayonet
M6	Dial Light		Radio - #44, Bayonet
M7	Tuner	KRK22D	VHF - Model 21S-548
M8	Tuner	KRK30C	VHF-UHF - Model 21-S-548U
M9	Switch	79374	VHF-UHF - Model 21S-548U
M10	Switch	79705	TV-Phono-Tone
M11	Printed Circuit	79142	Sound IF
M12	Focus Magnet	76168	Includes Centering Device
M13	Ion Trap	76141	
M14	Tuning Cap.	79526	2 Gang (22-285MMF; 17-135MMF)
A9	Trimmer Cap.	77616	43.5MC IF Trap (4-40MMF)
A5	Trimmer Cap.	78220	Video IF Input (5-70MMF)
B3	Trimmer Cap.	71807	Horiz. Drive (10-160MMF)
	Knob	79133	TV-Phono-Tone Switch
	Knob	79445	On-Off-Volume - Blonde Tropical Hardwood Instruments
	Knob	79471	On-Off-Volume - Mahogany Instruments
	Knob	79444	Contrast - Blonde Tropical Hardwood Instruments
	Knob	79470	Contrast - Mahogany Instruments
	Knob	79686	Radio Dial Sel. - Blonde Tropical Hardwood Instruments
	Knob	79685	Radio Dial Sel. - Mahogany Instruments
	Knob	79426	UHF Channel Sel. - Blonde Tropical Hardwood Instruments - Model 21-S-548U only.
	Knob	79467	UHF Channel Sel. - Mahogany Instruments - Model 21-S-548U only.
	Knob	79465	UHF Fine Tuning - Model 21-S-548U only.
	Knob	79425	VHF Channel Sel. - Blonde Tropical Hardwood Instruments - Model 21-S-548 only.
	Knob	79466	VHF Channel Sel. - Mahogany Instruments - Model 21-S-548 only.
	Knob	79464	VHF Fine Tuning - Model 21-S-548 only.
	Safety Glass	78815	
	Mask	79438	

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TROUBLE SHOOTING AIDS (cont)

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V14, V15, V16 and V17. Check M1 fuse. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check T2, T4A, T5, C105, C106, C103, R113, R112 and other associated components.	Check L40, L41, C98, C99, C102, R109, R108, and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V15, V16 and V18. Check adjustments B3 and B4. Check R113, C102 and other associated components.

BLOOMING

Check by substitution V15, V16, V17 and V18. Check C102, C99, R113, R112 and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss Of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak Or No Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V1, V2, V3, V4, V5, V6 and V7. Check video IF components for failure or change of value.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

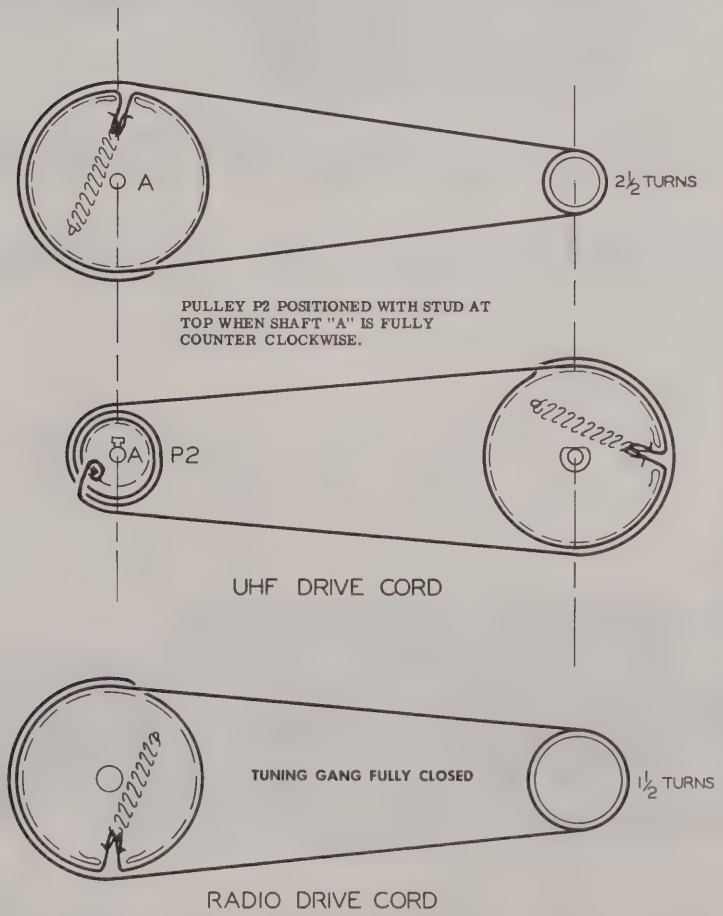
KEYSTONE EFFECT

Check T4 and its associated components.

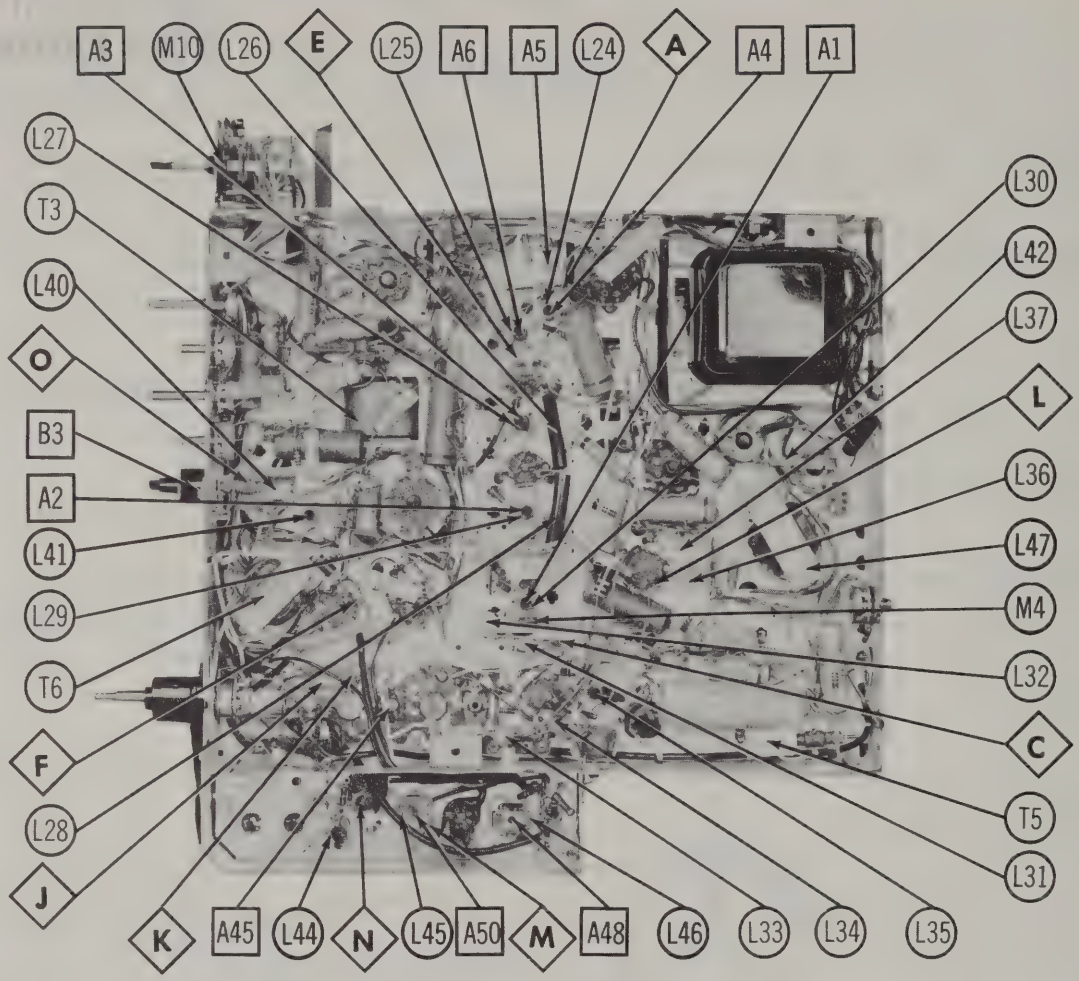
INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

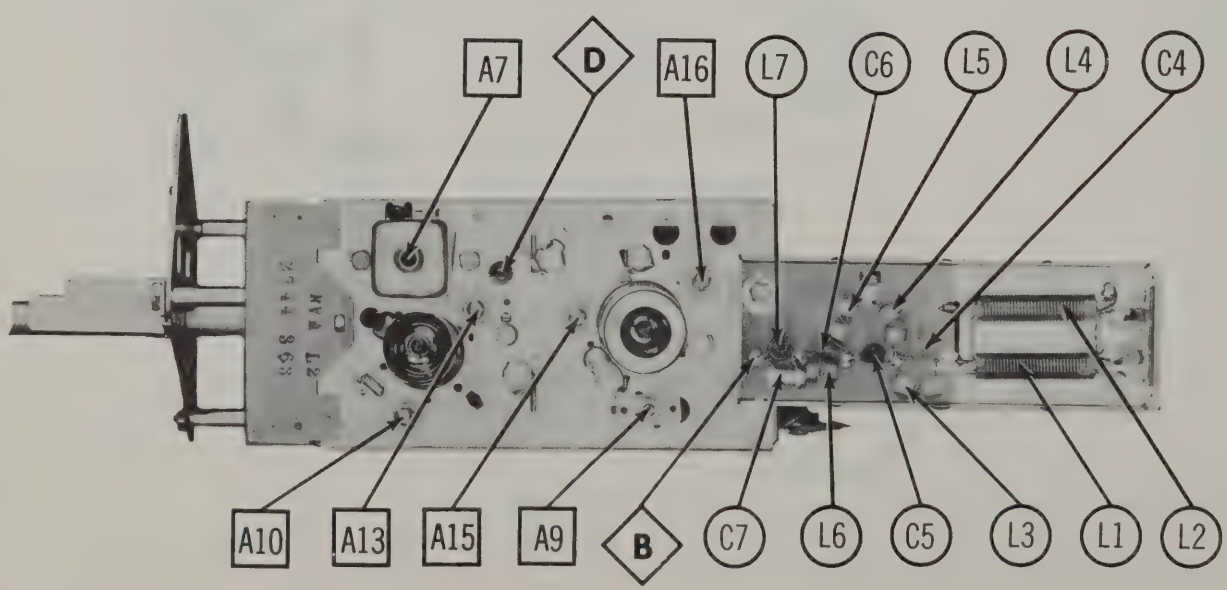
Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



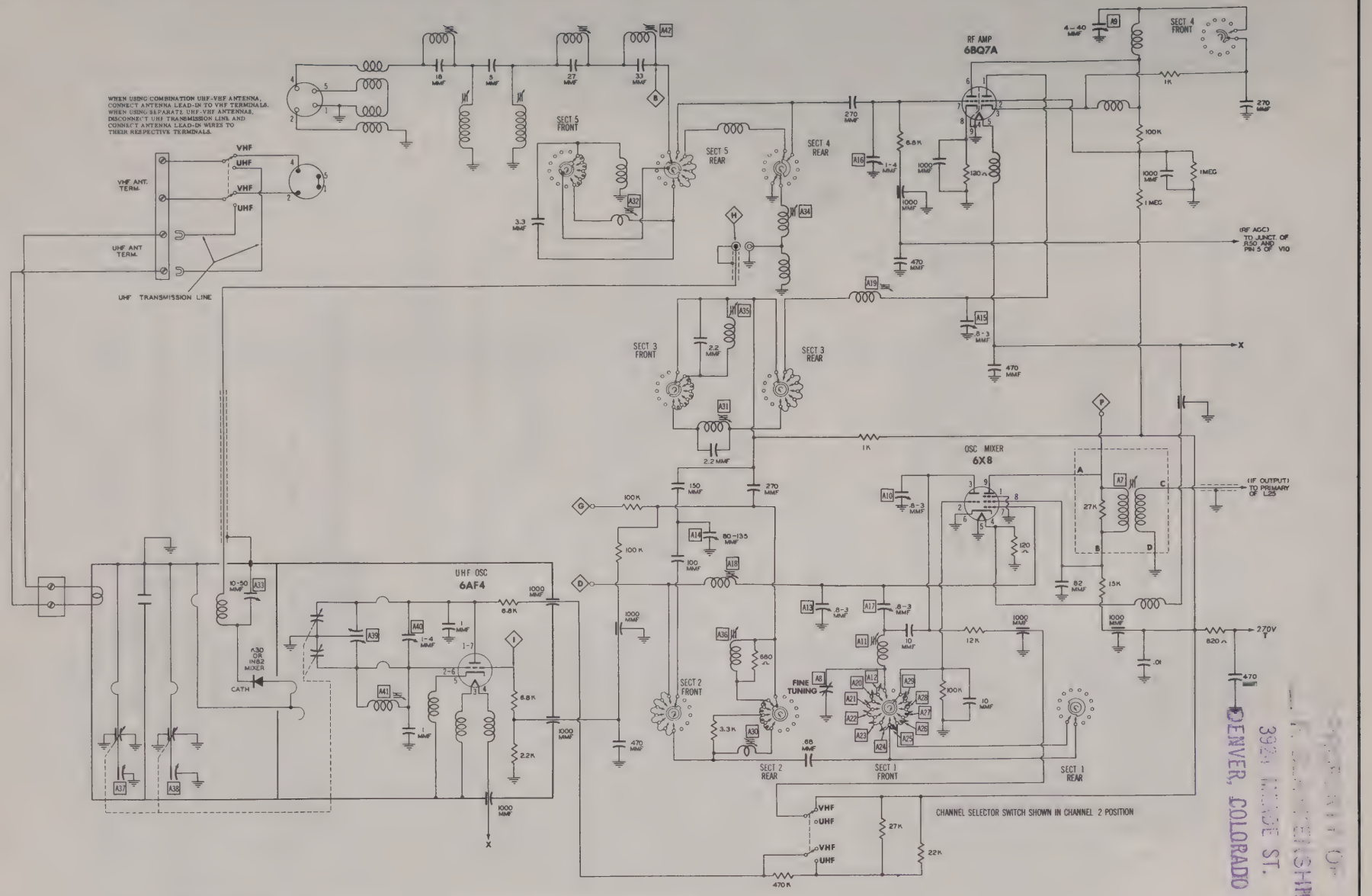
DRIVE CORD STRINGING



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



RF TUNER-TOP VIEW


WHEN USING COMBINATION UHF-VHF ANTENNA, CONNECT ANTENNA LEAD-IN TO VHF TERMINALS. WHEN USING SEPARATE UHF-VHF ANTENNAS, DISCONNECT UHF TRANSMISSION LINE AND CONNECT ANTENNA LEAD-IN WIRES TO THEIR RESPECTIVE TERMINALS.
VHF ANT. TERM.
UHF ANT. TERM.
VHF
UHF
UHF TRANSMISSION LINE
RF AMP 6BQ7A
SECT 4 FRONT
SECT 5 FRONT
SECT 5 REAR
SECT 4 REAR
SECT 3 FRONT
SECT 3 REAR
SECT 2 FRONT
SECT 2 REAR
SECT 1 FRONT
SECT 1 REAR
OSC MIXER 6X8
UHF OSC 6AF4
A30 OR IN82 MIXER
CATH
FINE TUNING
(RF AGC) TO JUNCT OF R50 AND PIN 5 OF V10
(IF OUTPUT) TO PRIMARY OF L25
270V
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 2 POSITION
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1955
UHF-VHF TUNER KRK30C USED ON CHASSIS KCS88P

ALTERNATE TUNER SCHEMATIC

RCA VICTOR MODELS 21-S-548, U (Ch. KCS88N, P & Radio Tuner Ch. RK191)

DENVER, COLORADO

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

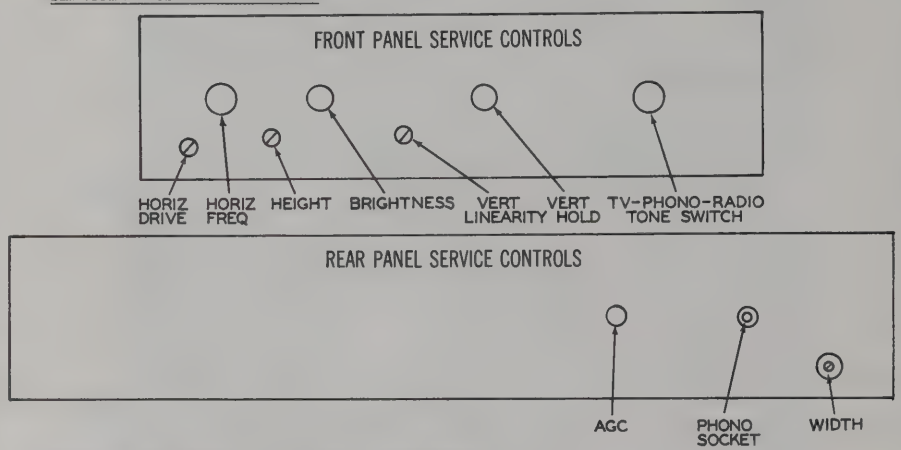
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove 10 spring clips from inside of cabinet. Remove metal molding and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



SPECIAL ADJUSTMENT - AGC CONTROL ADJUSTMENT

If receiver overloads on a strong signal, turn AGC control counter clockwise until picture on screen shows no sign of pulling. Never adjust AGC control on the weakest signal being received.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The horizontal frequency control (B1) is located on the front panel of the chassis and is used as the horizontal hold control. If horizontal sync cannot be brought in with B1 set it approximately at its mid-range position and adjust horizontal phase slug (B2) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L39) located on bottom of chassis. Hole in bottom of cabinet is provided for adjustment. (See tube placement chart).

FUSES

One fuse is used for horizontal sweep circuit protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 5 push-on type control knobs from front panel of cabinet.
2. Remove 1 push-on type control knob from under control door.
3. Remove 2 spring clips from rear cover.
4. Disconnect antenna leads.
5. Loosen 2 wood screws. Remove rear cover.
6. Disconnect picture tube socket, deflection yoke, HV lead, speaker leads, phono coax lead and phono motor lead.
7. Remove 5 chassis bolts. Remove chassis.

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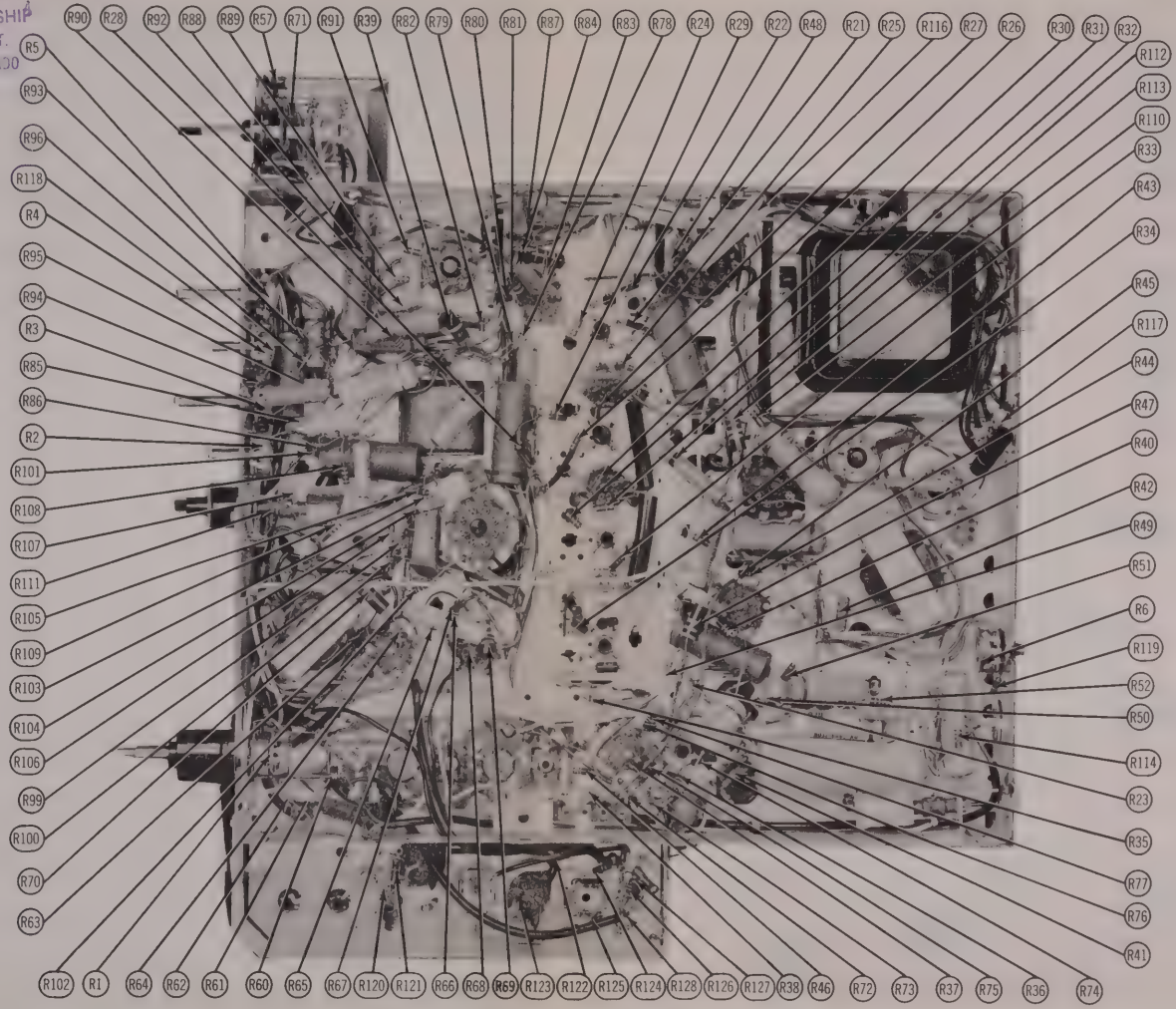

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

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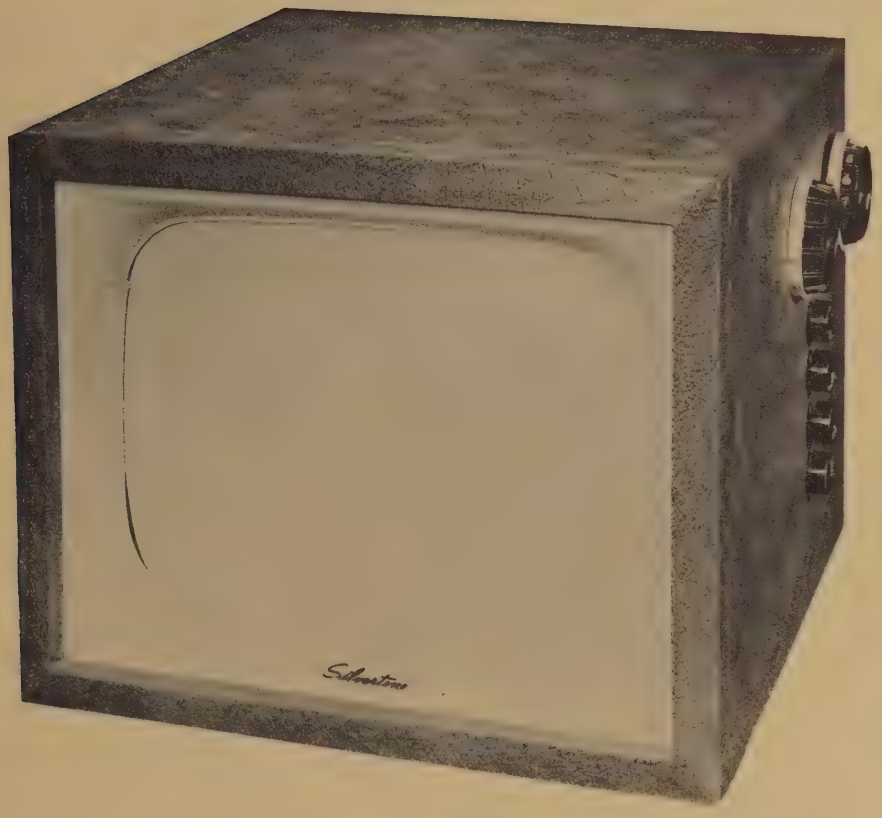

MODEL 5101

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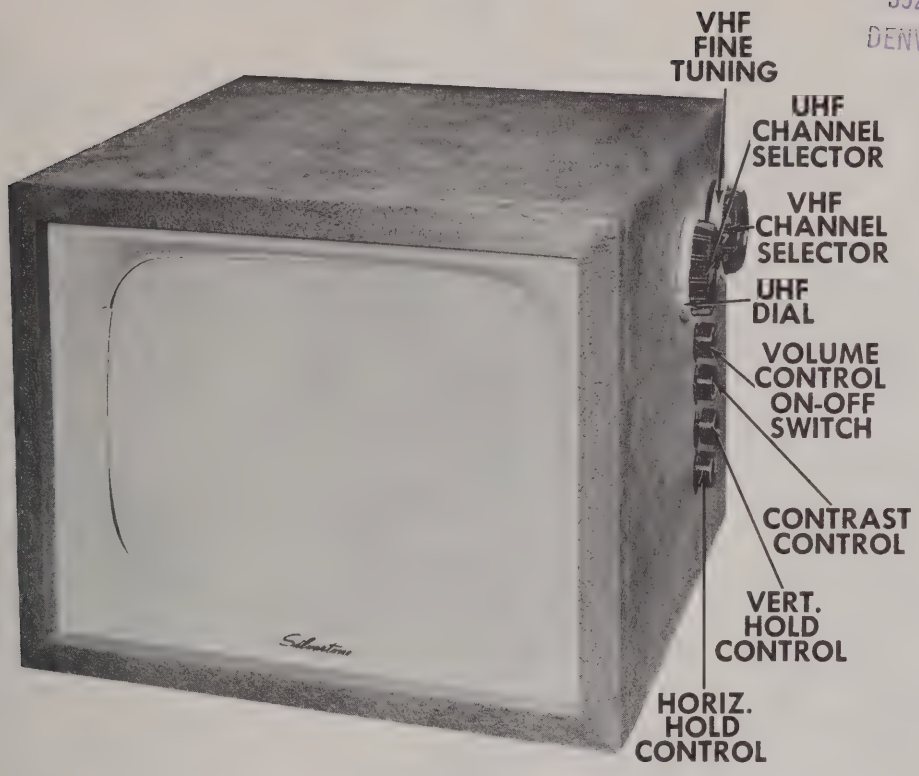

SILVERTONE MODELS 5101, A, 5106, 5107, A, 5112, A, C, 5115, A, B, C, D, 5117, A, B, C, D, 5125, 5127, A, B, C, 5129, A, B, C, D, 5131, A, B, C, D, 41122, 41292, A, 41312, A (Ch. 528.31500, 528.31600, 528.31700, 528.33800, 528.33900, 528.34200, 528.34600, 528.34601, 528.34602, 528.34603)

SILVERTONE MODEL 5101 (Ch. 528. 31500)

TRADE NAME	Silvertone	MODELS	CHASSIS
		5101, 5107	528. 31500
		5112, 5115, 5117, 5127, 5129, 5131	528. 31600
		5106	528. 31700
		5101A, 5107A	528. 33800
		5112A, 5115B, 5117B, 5127A, 5127B, 5129B, 5131B, 41122, 41292A, 41312A	528. 33900
		5112C, 5115A, 5117A, 5125, 5127C, 5129A, 5131A, 41292, 41312	528. 34200
		5115C, 5117C, 5129C, 5131C	528. 34600
		5115D, 5117D, 5129D, 5131D	528. 34601
			528. 34602
			528. 34603

SUPPLIER	Sears Roebuck & Co., 925 S. Homan Ave., Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Seventeen
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.3 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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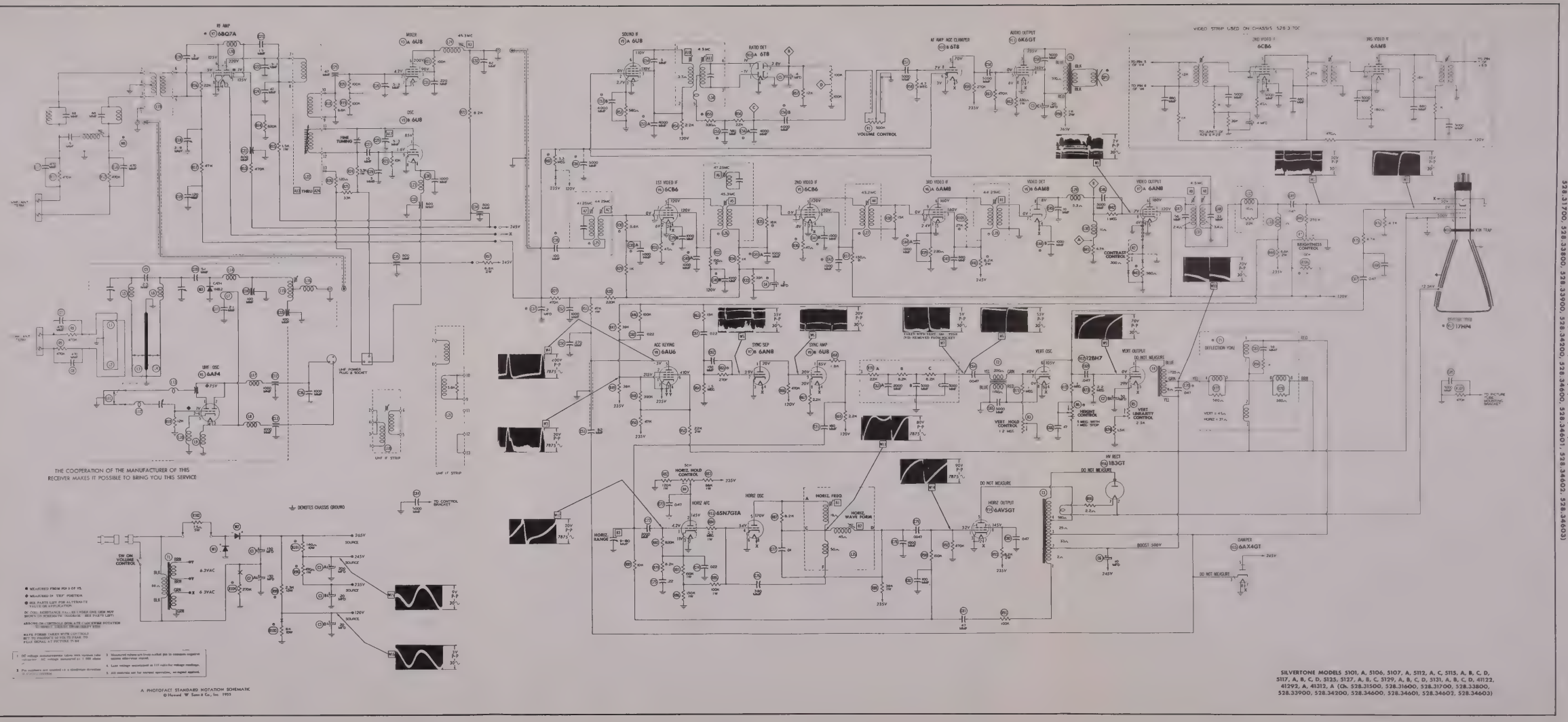
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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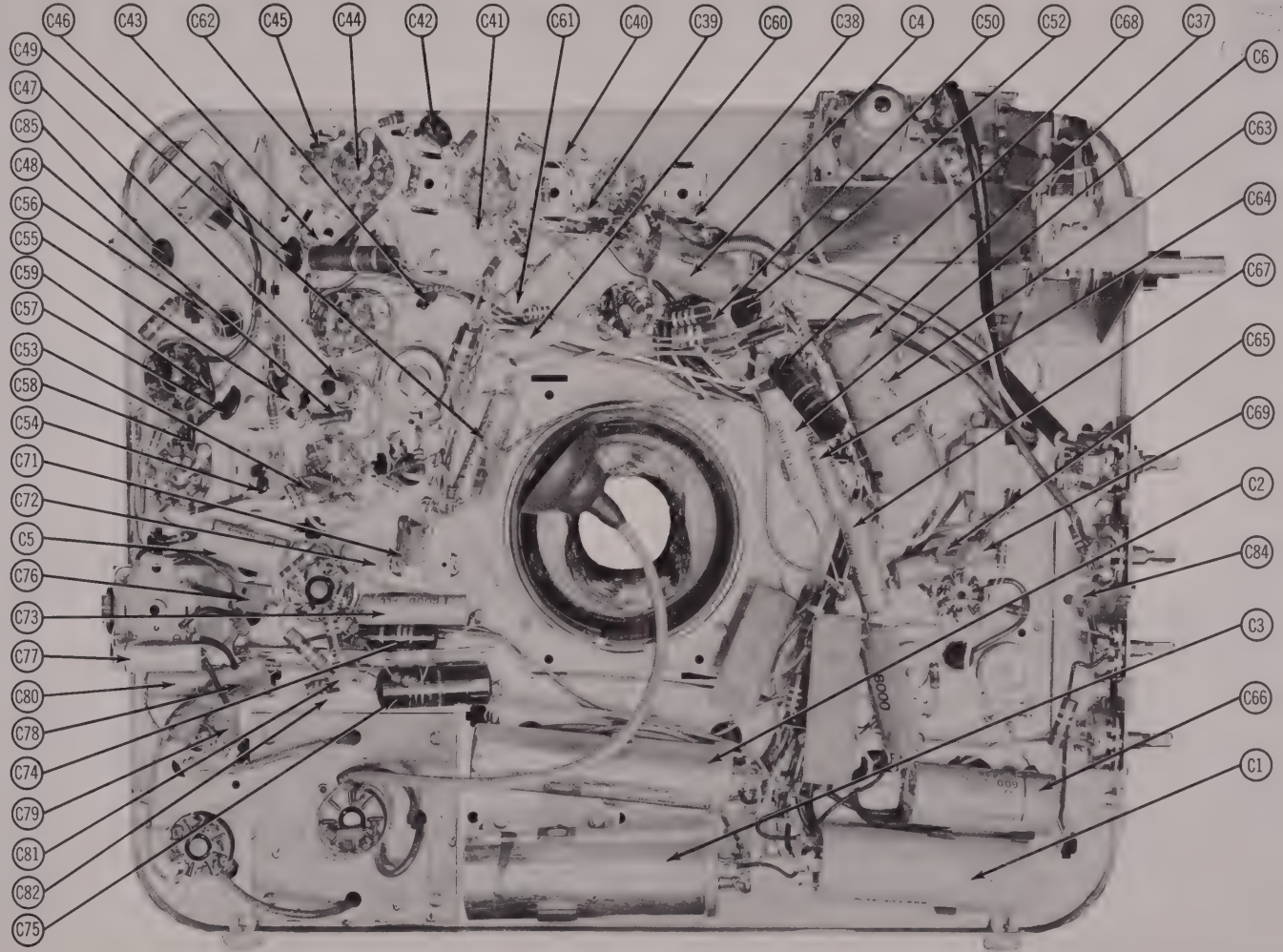
SILVERTONE MODELS 5101, A, 5106, 5107, A, 5112, A, C, 5115, A, B, C, D, 5117, A, B, C, D, 5125, 5127, A, B, C, 5129, A, B, C, D, 5131, A, B, C, D, 41122, 41292, A, 41312, A (Ch. 528.31500, 528.31600, 528.31700, 528.33800, 528.33900, 528.34200, 528.34600, 528.34601, 528.34602, 528.34603)

SILVERTONE MODELS 5101, A, 5106, 5107, A, 5112, A, C, 5115, A, B, C, D, 5117, A, B, C, D, 5125, 5127, A, B, C, 5129, A, B, C, D, 5131, A, B, C, D, 41122, 41292, A, 41312, A (Ch. 528.31500, 528.31600, 528.31700, 528.33800, 528.33900, 528.34200, 528.34600, 528.34601, 528.34602, 528.34603)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CHASSIS TOP VIEW

SILVERTONE MODELS 5101, A, 5106, 5107, A, 5112, A, C, 5115, A, B, C, D, 5117, A, B, C, D, 5125, 5127, A, B, C, 5129, A, B, C, D, 5131, A, B, C, D, 41122, 41292, A, 41312, A (Ch. 528.31500, 528.31600, 528.31700, 528.33800, 528.33900, 528.34200, 528.34600, 528.34601, 528.34602, 528.34603)



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

...RTY OF
...NSHIP,
... ST.
...RADO

SILVERTONE MODELS 5101, A, 5106, 5107, A, 5112, A, C, 5115, A, B, C, D, 5117, A, B, C, D, 5125, 5127, A, B, C, 5129, A, B, C, D, 5131, A, B, C, D, 41122, 41292, A, 41312, A (Cn. 528.31500, 528.31600, 528.31700, 528.33800, 528.33900, 528.34200, 528.34600, 528.34601, 528.34602, 528.34603)

TUBE PLACEMENT CHART

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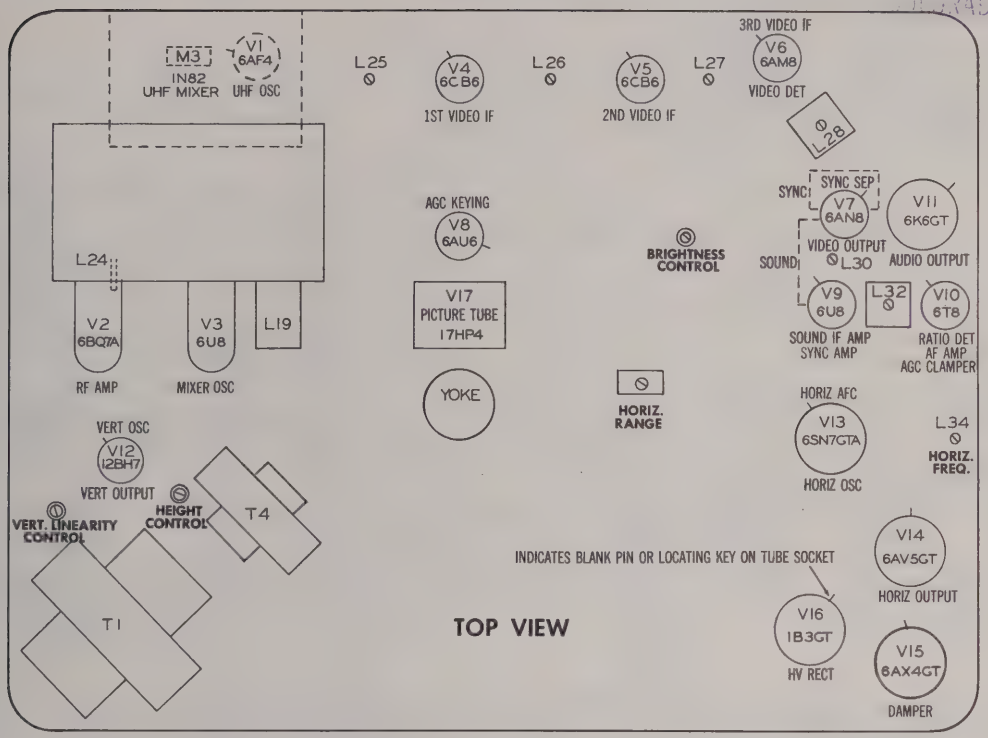

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifiers (M1 & M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6, V7 (V1 UHF only)**
No pic, no sound, has snow - **V2, V3, V4**
No pic, has sound, has raster - **V7, V8, V17**
Has pic, no sound - **V9, V10, V11**
Overloaded picture - **V8, V10**

SYNC FAILURE
No vert. sync - **V9, V12**
No horiz. sync - **V9, V13**
No vert. or horiz. sync - **V7, V9**

SWEEP FAILURE
No raster, has sound - **V13, V14, V15, V16, V17**
No vertical deflection - **V12**
Poor vert. linearity or foldover - **V12**
Poor horiz. linearity or foldover - **V13, V14, V15**
Narrow picture - **V13, V14, V15, V16, M1, M2**
Vert. off freq. - **V9, V12**
Horiz. off freq. - **V9, V13**

SILVERTONE MODELS 5101, A, 5106, 5107, A, 5112, A, C, 5115, A, B, C, D, 5117, A, B, C, D, 5125, 5127, A, B, C, 5129, A, B, C, D, 5131, A, B, C, D, 41122, 41292, A, 41312, A (Ch. 528.31500, 528.31600, 528.31700, 528.33800, 528.33900, 528.34200, 528.34600, 528.34601, 528.34602, 528.34603)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage lead should be securely taped and kept away from the chassis.
Do not remove the horizontal oscillator tube (V13) to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative side of a 4.5 volt bias supply to the ungrounded side of C4.
Connect the positive lead to chassis. Short antenna leads together.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube (V3). Low side to chassis.	44.25MC (Unmod)	Any non-interfering channel	DC probe to point (A). Common to chassis.	A1	Detune L25 and L26 slugs. Attenuate generator output to maintain not more than 2.5 volts on VTVM. Adjust for maximum deflection.
2.	"	"	"	"	"	A2, A3	Detune L24 slug. Attenuate generator output to maintain not more than 2.5 volts on VTVM. Adjust for maximum deflection.
3.	"	"	43.2MC	"	"	A4	Adjust for maximum deflection. Attenuate generator output to maintain not more than 2.5 volts on VTVM.
4.	"	"	45.3MC	"	"	A5	"
5.	"	"	47.25MC	"	"	A6	Adjust for MINIMUM deflection. Increase generator output to provide usable indication on VTVM. Recheck step 4 adjustment. If necessary, SLIGHTLY retouch A5.
6.	"	"	41.25MC	"	"	A7	Adjust for MINIMUM deflection. Increase generator output to provide usable indication on VTVM.

OVERALL VIDEO IF RESPONSE CHECK

Attenuate generator output to maintain 2 volts peak to peak on scope.
Leave bias connected as in "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Direct	High side to an ungrounded tube shield floating over converter tube (V3). Low side to chassis.	44.25MC (10MC Swp)	41.25MC 42.75MC 43.8MC 44.25MC 45.0MC 45.75MC 47.25MC	Any non-interfering channel	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.		Check for response curve similar to Fig. 1. If necessary, retouch A1 thru A5 to obtain desired response. A3 positions 45.75MC marker and A2 affects tilt.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistor in series from point (B) to chassis. The junction of these two resistors is alignment point (D) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.01MFD	High side to point (E). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point (B). Common to chassis.	A8, A9, A10	Adjust for maximum deflection. Attenuate generator output to maintain not more than .1 volt on VTVM.
9.	.01MFD	"	"	"	DC probe to point (C). Common to point (D).	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

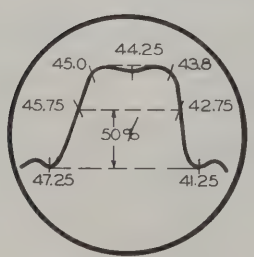

FIG. 1

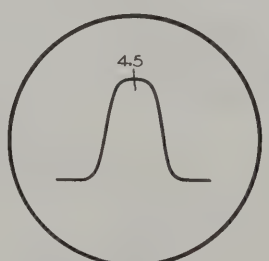

FIG. 2

ALIGNMENT INSTRUCTIONS (cont)

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...ANA 50460

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.001MFD	High side to point E . Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any non-interfering channel	Vert. Amp. to point B . Low side to chassis.	A8, A9, A10	Disconnect stabilizing capacitor C5. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
9.	"	"	"	"	"	Vert. Amp. to point C . Low side to chassis.	All	Reconnect stabilizing capacitor C5. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A10 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Replace shield over converter tube (V3).
The channel oscillator adjustment screws are reached thru a hole just to the left of the channel switch shaft. The correct adjustments are accessible thru this hole as the channel switch is turned to each channel.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency. Approximately the same amount for a majority of the channels, it may be possible to correct them in one step using A12. It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel.
Leave bias supply connected as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to point A . Low side to chassis.	A13	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A14	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A15	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A16	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A17	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A18	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A19	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A20	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A21	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A22	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A23	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A24	

4.5MC TRAP ALIGNMENT

Tune in a local TV station and inspect the picture for evidence of a 4.5MC beat interference. If necessary, adjust A9 until the horizontal scanning lines are smooth and continuous.

RF AND MIXER ALIGNMENTS

The RF and mixer portions of this receiver has been properly aligned at the factory and are very stable. Alignment of these positions should not be required in the field.

UHF CONVERTER ALIGNMENT

The UHF converter portion of this receiver has been properly aligned at the factory and is very stable. Alignment of it should not be required in the field.

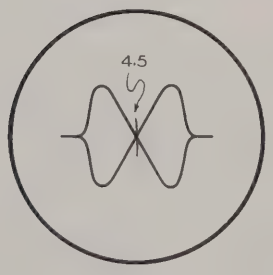


FIG. 3

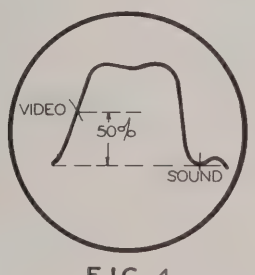


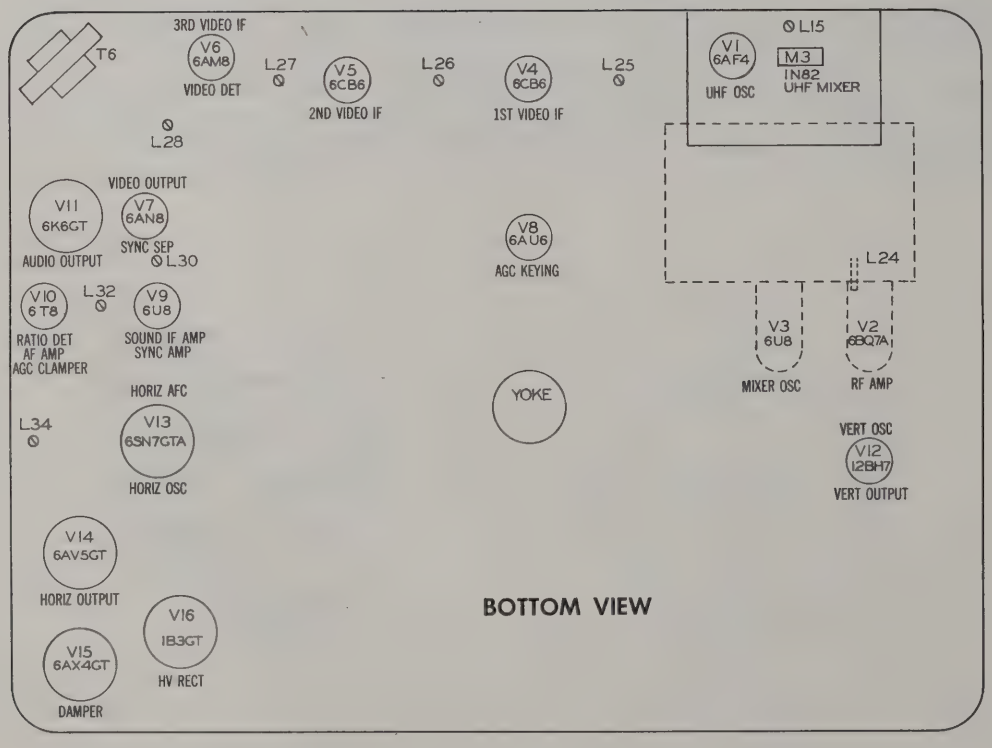
FIG. 4

SILVERTONE MODELS 5101, A, 5106, 5107, A, 5112, A, C, 5115, A, B, C, D, 5117, A, B, C, D, 5125, 5127, A, B, C, 5129, A, B, C, D, 5131, A, B, C, D, 41122, 41292, A, 41312, A (Ch. 528.31500, 528.31600, 528.31700, 528.33800, 528.33900, 528.34200, 528.34600, 528.34601, 528.34602, 528.34603)

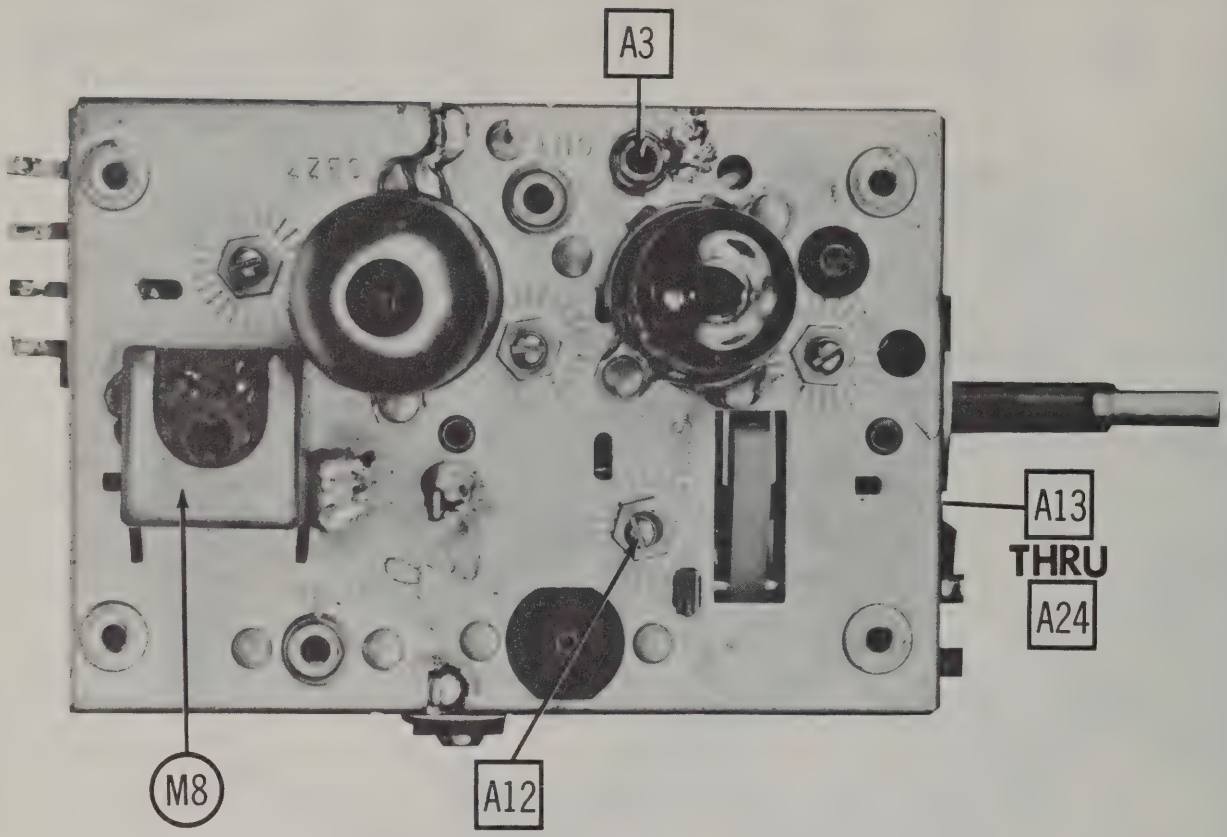
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	†■10KΩ	12KΩ	.1Ω	0Ω	0Ω	12KΩ	†■10KΩ		
V 2	6BQ7A	†1.6KΩ	†300KΩ	INF	0Ω	.1Ω	INF	600KΩ	0Ω	0Ω
V 3	6U8	†10KΩ	200KΩ	†100KΩ	.1Ω	0Ω	†8.3KΩ	0Ω	0Ω	10KΩ
V 4	6CB6	45KΩ	47Ω	0Ω	.1Ω	†2.4KΩ	†2.4KΩ	0Ω		
V 5	6CB6	40KΩ	47Ω	0Ω	.1Ω	†2.4KΩ	†2.4KΩ	0Ω		
V 6	6AM8	220Ω	0Ω	†8.3KΩ	.1Ω	0Ω	†8.3KΩ	0Ω	4.7KΩ	0Ω
V 7	6AN8	†470KΩ	1.8Meg	0Ω	.1Ω	0Ω	†7.5KΩ	†2.3KΩ	1Meg	50Ω
V 8	6AU6	†40KΩ	†600Ω	†600Ω	†600Ω	270KΩ	▲22KΩ	†600Ω		
V 9	6U8	†6.3KΩ	3.4Ω	†4.5KΩ	.1Ω	0Ω	†4.5KΩ	560Ω	2.2KΩ	†470KΩ
V 10	6T8	INF	12KΩ	INF	0Ω	.1Ω	550KΩ	0Ω	4.7Meg	†250KΩ
V 11	6K6GT	NC	0Ω	†1.4KΩ	†1KΩ	470KΩ	TP	.1Ω	330Ω	
V 12	12BH7	▲1.7KΩ	2.2Meg	3KΩ	.1Ω	.1Ω	▲2.5Meg	1.2Meg	1.2KΩ	0Ω
V 13	6SN7GTA	850KΩ	†50KΩ	300KΩ	250KΩ	†40KΩ	0Ω	0Ω	.1Ω	
V 14	6AV5GT	470KΩ	0Ω	0Ω	NC	▲25Ω	NC	.1Ω	†8.8KΩ	
V 15	6AX4GT	NC	NC	60KΩ	NC	†140Ω	NC	.1Ω	0Ω	
V 16	1B3GT		PINS	1 - 8	HAVE	INFINITE	RESISTANCE			Top Cap ▲585Ω
V 17	17HP4	0Ω	4.7KΩ	Pin 6 ▲33Ω	Pin 10 ▲33Ω	Pin 11 †300KΩ	Pin 12 .1Ω			

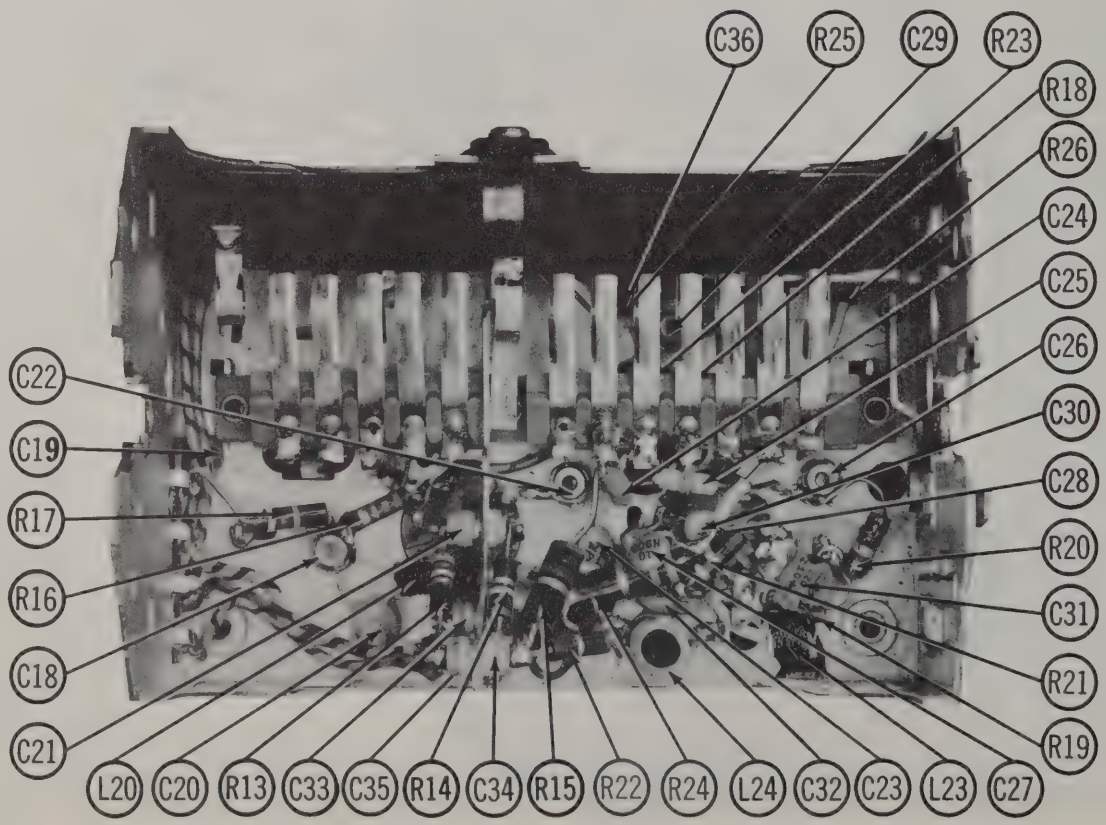
† MEASURED FROM OUTPUT OF M2.
■ MEASURED IN "UHF" POSITION.
▲ MEASURED FROM PIN 3 OF V15.
NC - NO CONNECTION
TP - TIE POINT



TUBE PLACEMENT CHART



VHF TUNER-TOP VIEW



VHF TUNER-BOTTOM VIEW

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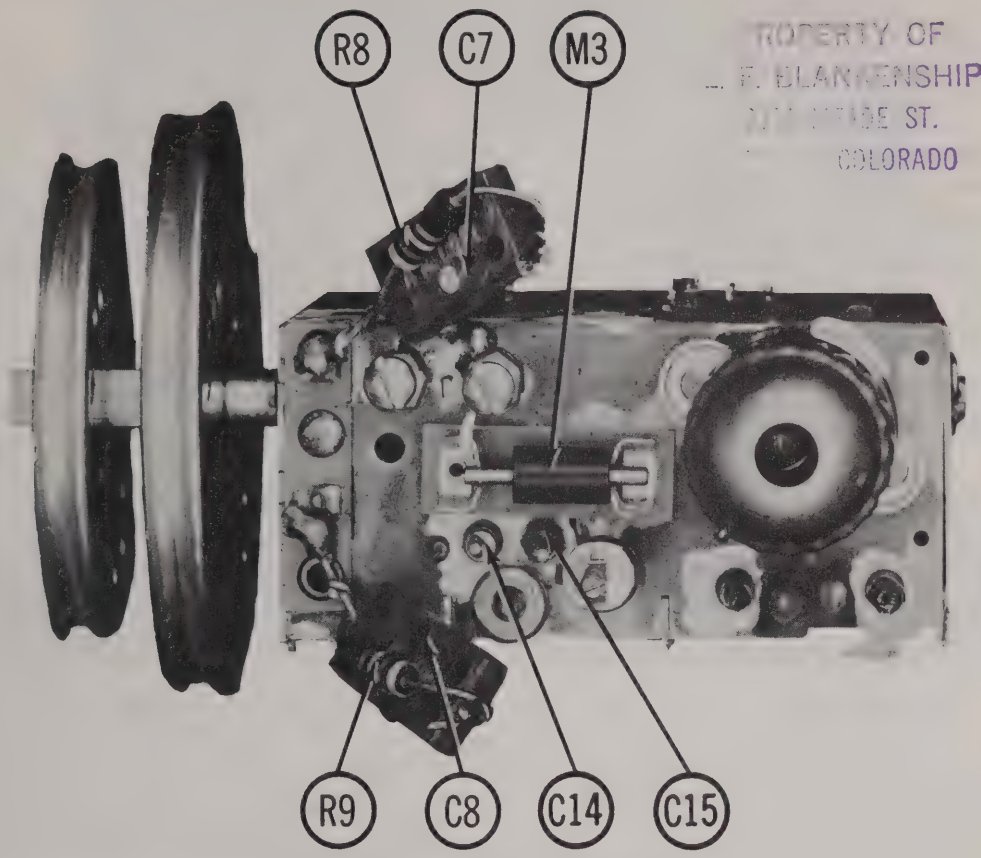
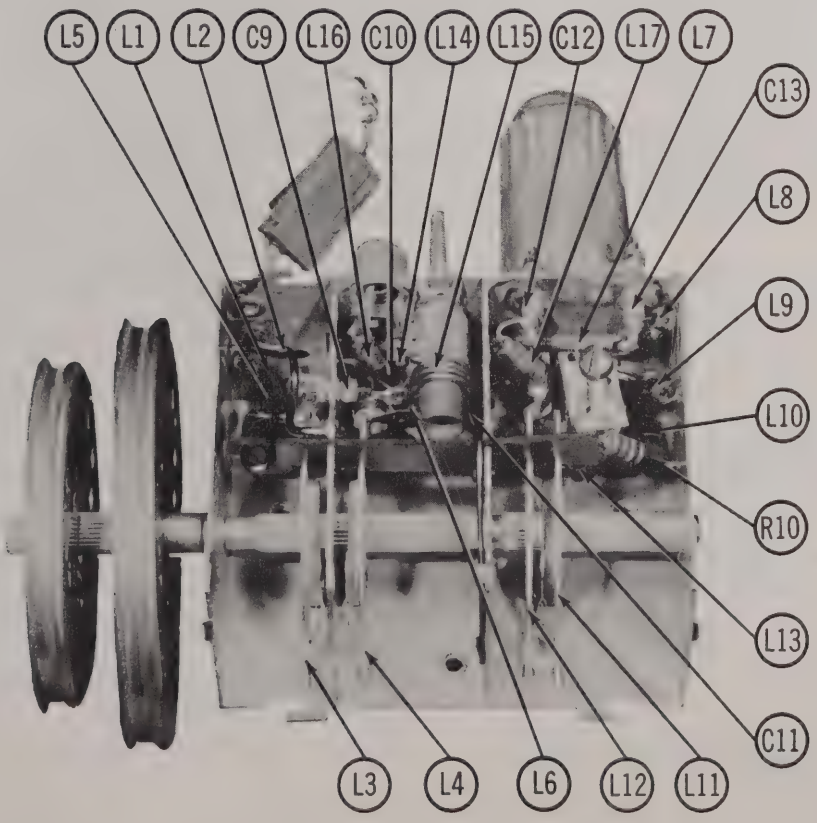
F. BLANKENSHIP
COLORADO



UHF TUNER TOP VIEW



UHF TUNER-RIGHT SIDE

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V14 and V15. Check M1 and M2. Check T3, T5A, C79, C82, R93, R102 and other associated components.

DRIVE LINES

Check by substitution V14 and V15. Check C79, C77, C78, R93, R102, T3, T5A and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V14 and V15. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V13, V14 and V15. Check R80 and C74 for open. Check L35, R87, C77, C76 and other associated components.

XMAS TREE EFFECT

Check by substitution V13, V14 and V15. Check T3 and T5 for internal arcing. Check L35, C81, C82, C76, C79, R88, R83 and other associated components.

VERTICAL

LOSS OF SWEEP

Substitute V12. Check waveform W9.

If Satisfactory	If Unsatisfactory
Check T4, T5B, C2B, R74, R5 and other associated components.	Check T2, C65, C66, C69, R72, R6 and other associated components.

INSUFFICIENT SWEEP

Substitute V12. Check height and vertical linearity controls for porper operation. Check R72, T4 and other associated components.

COMPRESSED AT BOTTOM

Substitute V12. Check R6, R72, C69, T2 and other associated components.

COMPRESSED AT TOP

Substitute V12. Check C69, C2B, T4, R74, R5 and other associated components.

FOLDS

Substitute V12. Check C66, C69, R72, T4, T5B and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V7 and V9. Check C61, C62, R66, R68, R69 and other associated components.

LOSS OF VERTICAL SYNC - HORIZONTAL SYNC SATISFACTORY

Substitute V12. Check vertical integrator network. Check C64, R3, R71, T2 and other associated components.

LOSS OF HORIZONTAL SYNC - VERTICAL SYNC SATISFACTORY

Substitute V13. Check C71, C72, L35, R82, R83 and R4. Check adjustments B1, B2 and B3. Check other components associated with V13.

HORIZONTAL BENDING

Check by substitution V7, V9 and V13. Check components associated with V13.

VIDEO

LOSS OF VIDEO

Substitute V7. Check C46, C49, R44, L33 and other associated components.

SOUND BARS (4.5MC Beat)

Adjust tuner fine tuning for best sound and picture. Check adjustment A9. Check video IF alignment.

POOR CONTRAST

Substitute V7. Check contrast control. Check C46, C49, L32, R43 and other associated components.

NEGATIVE PICTURE

Substitute V7. Check picture tube. Check video detector network. Check R43, C46, C49 and other associated components.

SMEAR

Substitute V7. Check L29, L30, L32, C46, C49, R44 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V2, V3, V4, V5, V6 and V7 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V9, V10 and V11. Check stages V10 and V11 using audio signal generator. Apply audio signal across R1.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF stages for component failure or change of value.	Check C57, C58, C59, R59, R62, T6, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A11 for minimum buzz. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly. Check switch on volume control and T1. If filaments to light, check M1, M2 and R102. Check B+ filter and decoupling network.

SMALL AND /OR DIM PICTURE

Check M1, M2 and R102. Check B+ filter and decoupling network.

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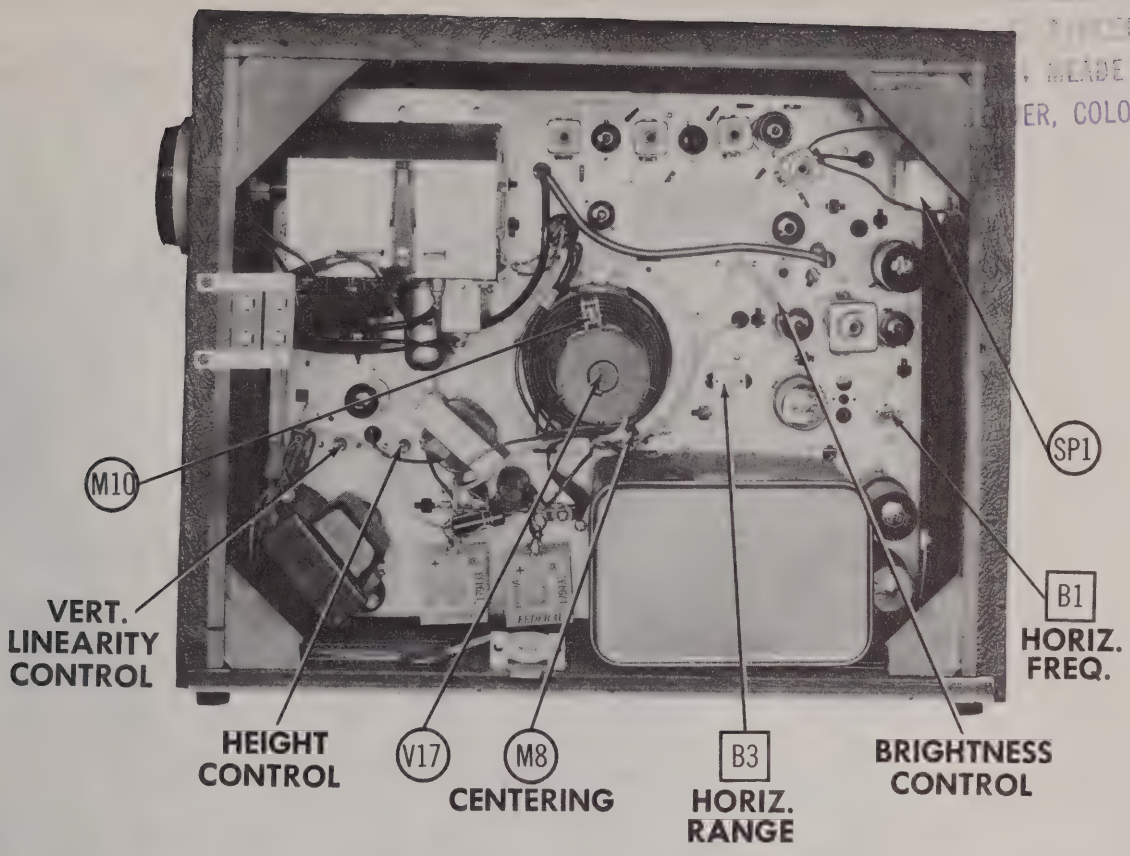


CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

(A) HORIZONTAL FREQUENCY ADJUSTMENT

1. Turn the horizontal range trimmer (B3). maximum clockwise.

2. If the picture cannot be synchronized with the horizontal hold control, set the control to its mid-range position and adjust the horizontal frequency slug (B1) until the picture is in sync. If the picture will not synchronize, turn the horizontal waveform slug (B2) several turns counter clockwise and readjust B1 until the picture synchronizes.

(B) HORIZONTAL WAVEFORM ADJUSTMENT

Connect the vertical amplifier of oscilloscope through a low capacity probe (Fig6) to terminal "C" of L35.

If necessary, adjust B2 for waveform similar to Fig. 5 with broad and narrow peaks of equal height. Keep the picture in sync while making this adjustment with the horizontal hold control or B1. Remove scope.

(C) HORIZONTAL RANGE ADJUSTMENT

1. Turn the horizontal hold control maximum counter clockwise. Switch off channel and back again. If the picture does not lose sync, turn B1 counter clockwise until picture loses sync when switching off channel and back again.

2. Turn the horizontal hold control maximum clockwise. Switch off channel then back again. If the picture does not pull in sync, turn the horizontal range trimmer (B3) clockwise until the picture pulls into sync.

3. Due to reaction between B1 and B3 it may be necessary to repeat steps 1 and 2 several times before proper synchronization is obtained. When properly adjusted, the picture should remain in sync at both extreme settings of the horizontal hold control when switching off channel and back again.

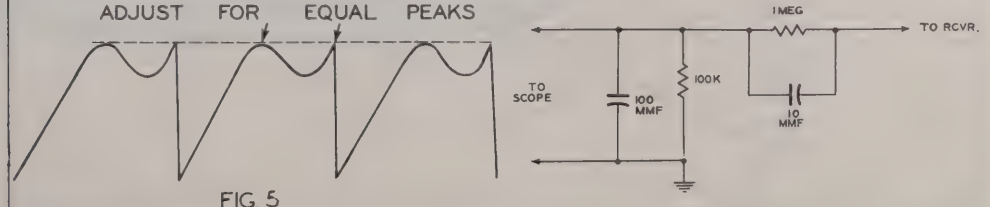
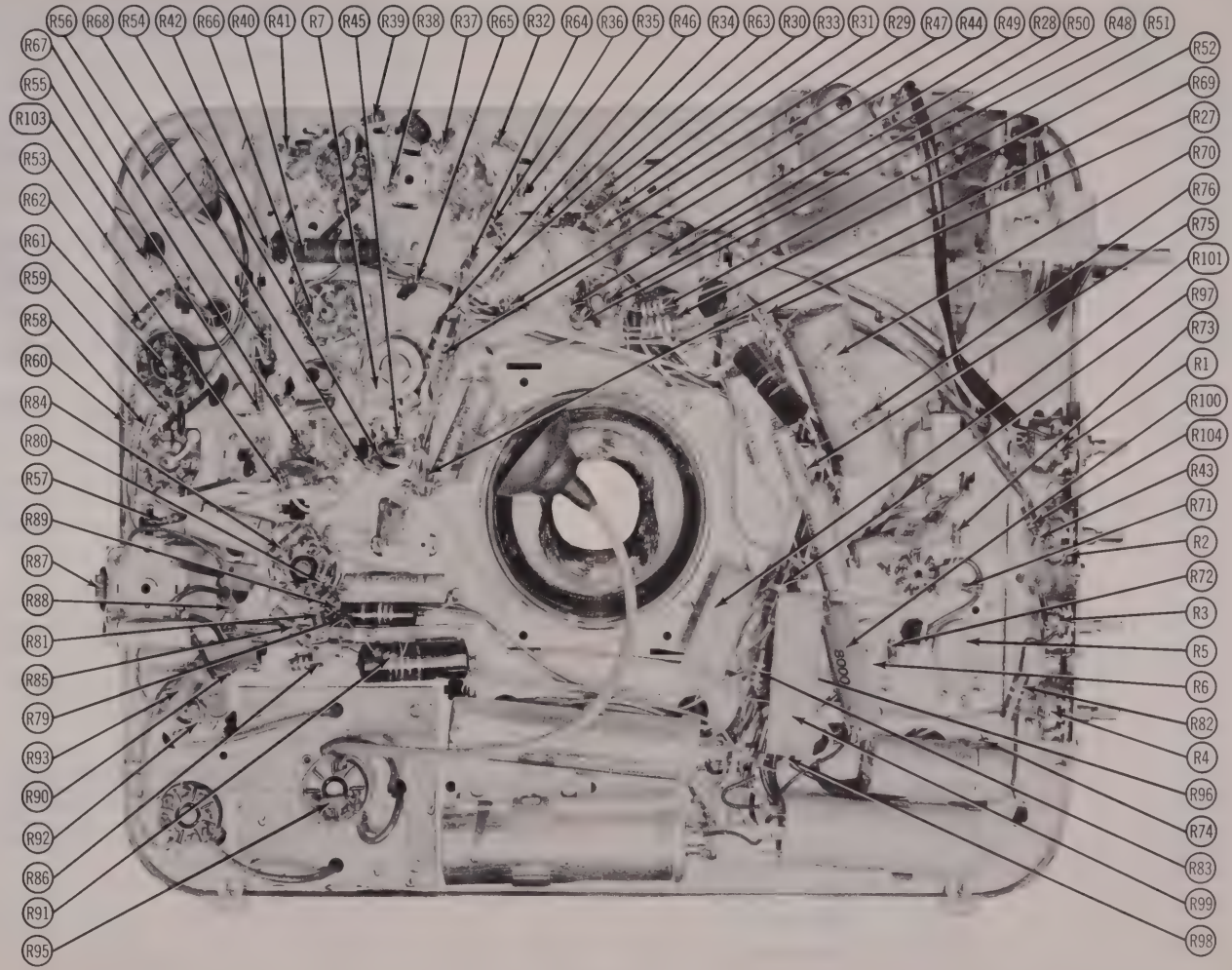


FIG. 5

SET 279 FOLDER 14



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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SILVERTONE MODELS 5101, A, 5106, 5107, A, 5112, A, C, 5115, A, B, C, D, 5117, A, B, C, D, 5125, 5127, A, B, C, 5129, A, B, C, D, 5131, A, B, C, D, 41122, 41292, A, 41312, A (Ch. 528.31500, 528.31600, 528.31700, 528.33800, 528.33900, 528.34200, 528.34600, 528.34601, 528.34602, 528.34603)

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		SILVERTONE PART No.	STANDARD REPLACEMENT		
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2	RF Amplifier	6BQ7A	6BQ7A	9AJ	Some models use 6BZ7
V3	Osc.-Mixer	6U8	6U8	9AE	
V4	1st. Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd. Video IF Amp.-Video Detector	6AM8	6AM8	9CY	
V7	Video Output-Sync Separator	6AN8	6AN8	9DA	
V8	AGC Keying	6AU6	6AU6	9BK	
V9	Sound IF Amp.-Sync Amp.	6U8	6U8	9AE	
V10	Ratio Detector-AF Amp.-AGC Clamper	6T8	6T8	9E	
V11	Audio Output	6K6GT	6K6GT	7S	
V12	Vert. Osc.-Vert. Output	12BH7	12BH7	9A	
V13	Horiz. AFC-Horiz. Osc.	6SN7GTA	6SN7GTA	8BD	
V14	Horiz. Output	6AV5GT	6AV5GT	6CK	
V15	Damper	6AX4GT	6AX4GT	4CG	
V16	HV Rectifier	1B3GT	1B3GT	3C	

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CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA					RETMA BASE TYPE	NOTES
	SILVERTONE PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.		
V17	17HP4	17HP4/17RP4 17HP4B ①	17HP4 / 17RP4	17HP4/17RP4	17HP4 / 17RP4	12L	① Aluminized
	21YP4	21YP4	21YP4	21YP4	21YP4	12L	
		21YP4A ①	21YP4A ①	21YP4A①	21YP4A ①	12L	
	21XP4	21XP4		21XP4		12L	
		21XP4A ①		21XP4A ①		12L	
	21AVP4					12L	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	SILVERTONE PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1	150	150	T18-323			FP117	TM-150-150	S-105	
C2A	■150	150	T18-322			FP117	TM-150-150	S-105	
B	▲50	25				TC29	TD-50-25	FM-0250	
C3A	▲200	300	T18-330				TM-4121	T-397	
B	20	300						FMD-4520	
C	■20	300							
D	▲20	300							
C4	2	50	T18-332			TC302	TD-2-50	MMT-0505	Note 1
C5	4	50	T18-292			TC30	TD-4-50	MMT-0505	
C6	10	300	T18-325			TC62	TD-12-350	FM-3512	
C7	470	1000	T15-304	DD16-471	1R5KV-471	MCL-347		K-2347	
C8	470	1000	T15-304	DD16-471	1R5KV-471	MCL-347		K-2347	
C9	2.5								
C10	5.1								
C11	2.1								
C12	1000			MFT-1000					
C13	1000			MFT-1000					
C14	100								
C15	100								
C16	470	1000	T15-304	DD16-102	1R5KV-471	MCL-347		K-2347	
C17	470	1000	T15-304	DD16-102	1R5KV-471	MCL-347		K-2347	
C18	3-9			829-10					
C19	120			D6-121	811-121	UC-5312			
C20	3			TCZ-3	NP0A-030	ZT-5533			
C21	800								
C22	.5-3			829-3	3115-01-0R5	CT565A			
C23	1.5			TCZ-1.5	NP0A-1R5	ZT-5515			
C24	47			DD-470	831-470	UC-5447			
C25	47								
C26	.5-3			829-3	3115-01-0R5	CT565A			
C27	10								
C28	5								
C29	.5-3			829-3	3115-01-0R5	CT565A			
C30	1000			DD-102	801-001	DC-521			
C31	220			D6-221	811-221	UC-5322			
C32	62								
C33	800								
C34	800								
C35	800								
C36	1000			DD-102	801-001	DC-521			
C37	2.0	200	T16-267				MT2-2		Note 2
C38	100		T15-292	D6-101	801-101	UC-531		K-1310	Note 3
C39A	1000		T15-286	DD2-102	812-001	DCD-521			Note 4
B	1000								
C40A	1000		T15-268	DD2-102	812-001	DCD-521			Note 5
B	1000								
C41A	1000		T15-286	DD2-102	812-001	DCD-521			Note 4
B	1000								
C42	1000		T15-220	DD-102	801-001	DC-521		K-1210	Note 6
C43	680		T15-290	D6-681	811-681	UC-5368		K-1368	
C44A	1000		T15-286	DD2-102	812-001	DCD-521			Note 4
B	1000								
C45	10		T16-251	TCN-10	N750K-100	NT-541			
C46	5000		T16-177	DD-502	811-005	DC-525		K-1250	
C47	56								
C48	33								
C49	.047	400	T16-447	DF-503		PT4147	IMP4-S47	3304147	
C50	270	1000	T15-289	DD30-27				K-2327	
C51	82	4000	T15-287	DD60-820				K-4482	

SILVERTONE MODELS 5101, A, 5106, 5107, A, 5112, A, C, 5115, A, B, C, D, 5117, A, B, C, D, 5125, 5127, A, B, C, 5129, A, B, C, D, 5131, A, B, C, D, 41122, 41292, A, 41312, A (Ch. 528.31500, 528.31600, 528.31700, 528.33800, 528.33900, 528.34200, 528.34600, 528.34601, 528.34602, 528.34603)

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CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA SILVERTONE PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	INSTALLATION NOTES
C53	1000		T15-230	DD-102		DC-531		K-1230	
C53A	4000			D6-402	832-004	DCD-534			Note 7
B	4000			D6-402					
C54	5		T15-232	TC2-5	NP0A-050	ZT-555			
C55	560		T15-303	D6-561	811-561	UC-5356		K-1356	Note 8
C56A	4000			D6-402	832-004	DCD-534			Note 7
B	4000			D6-402					
C57	5000		T16-177	DD-502	811-005	DC-535	DMP6-D5	C-1250	
C58	5000		T16-177	DD-502	811-005	DC-535	DMP6-D5	C-1250	
C59	5000		T16-177	DD-502	811-005	DC-535	DMP6-D5	C-1250	
C60	.022	400	T16-248	DF-203	817-02	PT4122	DMP4-S22	3304122	
C61	.022	400	T16-248	DF-203	817-02	PT4122	DMP4-S22	3304122	
C63	150		T15-295	D6-151	GP2K-151	UC-5315		K-1315	
C63A	2000					DC-523	DMP6-D2	C-1230	
B	5000		+T17-109		+1405-01	DC-525	DMP6-D5	C-1250	
C	5000					DC-525	DMP6-D5	C-1250	
C64	.0047	600	T16-230	D6-472	GP2-333-472	PT5247	DMP5-D47	3302547	
C65	5000		T16-177	DD-502	811-005	DC-535	DMP6-D5	C-1250	
C66	.47	600	T16-249			PT606	CTE-P5	3306047	
C67	.047	600	T16-245	DF-503		PT4147	DMP4-S47	3304147	
C68	.1	400	T16-254	DF-104		PT401	DMP4-P1	330401	
C69	.047	400	T16-245	DF-503		PT4147	DMP4-S47	3304147	
C70	.047	300	T16-255	DF-503		PT4147	DMP4-S47	3304147	Note 3
C71	180	500	T15-300			MC2537		KR-1318	
C72	3000		T15-301	DD-302	801-002	DC-532	DMP6-D2	C-1230	
C73	.047	400	T16-245	DF-503		PT4147	DMP4-S47	3304147	
C74	.022	300	T16-255	DF-303	817-02	PT4122	DMP4-S22	3304122	
C75	.33	200	T16-253			PT4023	DMP5-P33	3303023	
C76	390	500	T15-273			MC1349		KR-1339	
C77	.01	600	T16-243	D6-103	GP2-333-103	PT611	DMP6-S1	330611	
C78	1000	500	T15-288			MC2585		KR-1330	
C79	.0047	600	T16-233	D6-472	GP2-333-472	PT6347	DMP6-D47	3306347	
C80	.047	400	T16-245	DF-503		PT4147	DMP4-S47	3304147	
C81	47	500	T15-299			MC2535		KR-1647	
C83	100		T15-282	D6-101	801-101	UC-531			
C83	56	3000		DD30-560	3KV-560	DC30456			
C84	5000	1000	T15-305	DD15-502	1K5EV-472				
C85	5000	1000	T15-305	DD15-502	1K5EV-472				
C86	5000		T16-177	DD-502	811-005	DC-535		C-1250	Note 9

Note 1. Chassis 528.31700 use 4MFD in this application.
Note 2. Chassis 528.31700 use .47MFD in this application, other chassis may use 1.5MFD in this application.
Note 3. Not used in chassis 528.31700.
Note 4. Chassis 528.31700 use dual 5000MMF in this application (part #T15-294).
Note 5. Chassis 528.31700 use 680MMF for C40A and omit C40B.
Note 6. Chassis 528.31700 use 680MMF in this application.
Note 7. Some chassis use dual 5000MMF in this application.
Note 8. Chassis 528.31700 use 3300MMF in this application.
Note 9. Use in chassis 528.31800, 528.31900, 528.34300 and 528.34600.
* Items C83A, C83B, C83C, R70A, R70B and R70C are combined in one unit.

CONTROLS

ITEM No	RATING RESIST-ANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	A34-231	Q13-133	A47-500K-2	B8K-80-S	U-46	Volume
B	Shaft		Not Req.	Not Req.	838-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-13	Not Req.	U8-26	Attach to R1A
R2A	300Ω	½	A25-41	Q11-103	A47-500-S	AB-4		Contrast
B	Shaft		Not Req.	Not Req.	838-3	AK-4		Attach to R2A
R3A	1.5Meg	½	A25-44	Q11-139	A47-1.5Meg-S	AB-75	U-155	Vert. Hold
B	Shaft		Not Req.	Not Req.	838-3	AK-4	Not Req.	Attach to R3A
R4A	50KΩ	½	A25-43	Q11-123	A47-50K-S	AB-31	U-38	Horiz. Hold
B	Shaft		Not Req.	Not Req.	838-3	AK-4	Not Req.	Attach to R4A
R5A	2500Ω	½	A25-45	Q11-113	A47-2500-S	AB-7	SU-8	Vert. Linearity
B	Shaft		Not Req.	HQ	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	5Meg with 1Meg stop	½	A25-43	Q11-141	A47-4Meg-S	AB-86	SU-67	Height - Note 1
B	Shaft		Not Req.	HQ	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	100KΩ	½	A25-40	Q11-128	A47-100K-S	AB-40	SU-41	Brightness
B	Shaft		Not Req.	HQ	FKS-1/4	AK-1	Not Req.	Attach to R7A

Note 1: Connect a 1Meg resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down.)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SILVERTONE PART No	IRC PART No.	NOTES
R8	470KΩ	½		BTS-470K	
R9	470KΩ	½		BTS-470K	
R10	12KΩ	½		BTS-12K	
R11	470KΩ	1	T60-4740K	BTS-470K	
R12	470KΩ	½	T60-4740K	BTS-470K	
R13	470KΩ	½		BTS-470K	
R14	680KΩ	½		BTS-680K	
R15	1500Ω	1		BTA-1500	
R16	33KΩ	½		BTS-33K	
R17	47KΩ	½		BTS-47K	
R18	6800Ω	½		BTS-6800	
R19	100KΩ	½		BTS-100K	
R20	100KΩ	½		BTS-100K	
R21	100KΩ	½		BTS-100K	
R22	2200Ω	½		BTS-2200	
R23	10KΩ	½		BTS-10K	
R24	3300Ω	1		BTA-3300	
R25	33KΩ	½		BTS-33K	
R26	12KΩ	½		BTS-12K	
R27	470KΩ	½	T60-4740K	BTS-470K	
R28	220KΩ	½	T60-2240K	BTS-220K	
R29	100KΩ	½	T60-1032K	BTS-100K	
R30	5600Ω	½	T60-5620K	BTS-5600	Note 1
R31	47Ω	½	T60-4700K	BTS-47	
R32	150Ω	½	T60-1510K	BTS-150	Note 3
R33	39KΩ	½	T60-3930K	BTS-39K	
R34	1000Ω	½	T60-2030K	BTS-1000	
R35	18KΩ	½	T60-1830K	BTS-18K	Note 3
R36	47Ω	½	T60-4700K	BTS-47	Note 4
R37	150Ω	½	T60-1510K	BTS-150	Note 3
R38	15KΩ	½	T60-1530K	BTS-15K	Note 3
R39	220Ω	½	T60-2210K	BTS-220	Note 5
R40	8200Ω	2	T60-8232K	BTS-8200	Note 3
R41	470Ω	½	T60-4720K	BTS-4700	
R42	1Meg	½	T60-1050K	BTS-1Meg	
R43	560Ω	½	T60-5610K	BTS-560	Note 3
R44	5600Ω	½	T60-5622K	BTS-5600	
R45	270KΩ	½	T60-2740K	BTS-270K	
R46	100KΩ	½	T60-1040K	BTS-100K	
R47	39KΩ	½	T60-3930K	BTS-39K	
R48	390KΩ	½	T60-3940K	BTS-390K	
R49	39KΩ	½	T60-3930K	BTS-39K	
R50	47KΩ	½	T60-4730K	BTS-47K	
R51	47KΩ	1	T60-4731K	BTA-47K	
R52	22KΩ	2	T60-2232K	BTS-22K	
R53	560Ω	½	T60-5610K	BTS-560	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SILVERTONE PART No	IRC PART No.	NOTES
R54	330Ω	½	T60-3230K	BTS-3200	
R55	330Ω	½	T60-3310K	BTS-330	Note 6
R56	22KΩ	½	T60-2230K	BTS-22K	
R57	12KΩ	½	T60-1230K	BTS-12K	
R58	4.7Meg	½	T60-4750K	BTS-4.7Meg	
R59	3700Ω	½	T60-3740K	BTS-3700	
R60	3.3Meg 5%	½	T60-3350J	BTS-3.3Meg 5%	Note 7
R61	470KΩ	½	T60-4740K	BTS-470K	
R62	330Ω	½	T60-3311K	BTA-330	
R63	15KΩ	½	T60-1530K	BTS-15K	
R64	1.5Meg	½	T60-1550K	BTS-1.5Meg	
R65	270KΩ	½	T60-2740K	BTS-270K	Note 8
R66	470KΩ	½	T60-4740K	BTS-470K	
R67	2200Ω	½	T60-2220K	BTS-2200	
R68	180Ω	½	T60-1820K	BTS-1800	
R69	2200Ω	½	T60-2330K	BTS-2200	
R70A	22KΩ	½		BTS-22K	
B	8200Ω	½	#T17-109	BTS-8200	
C	8200Ω	½		BTS-8200	
R71	1Meg	½	T60-1050K	BTS-1Meg	
R72	1Meg	½	T60-1050K	BTS-1Meg	
R73	2.2Meg	½	T60-2250K	BTS-2.2Meg	
R74	150KΩ	½	T60-1520K	BTS-150K	
R75	4700Ω	½	T60-4720K	BTS-4700	
R76	4700Ω	½	T60-4730K	BTS-4700	
R77	560KΩ	½		BTS-560	
R78	5600Ω	½		BTS-5600	
R79	8200Ω	1	T60-8220K	BTS-8200	
R80	820KΩ	1	T60-8240K	BTS-820K	
R81	150KΩ	1	T60-1541K	BTA-150K	
R82	120KΩ	1	T60-1241K	BTA-120K	
R83	68KΩ	1	T60-6831K	BTA-68K	
R84	2.7Meg	1	T60-2751K	BTA-2.7Meg	
R85	100KΩ	1	T60-1041K	BTA-100K	
R86	150KΩ	1	T60-1541K	BTA-150K	
R87	8200Ω	½	T60-8232K	BTS-8200	
R88	39KΩ	1	T60-3931K	BTA-39K	
R89	10KΩ	½	T60-1032K	BTS-10K	
R90	150KΩ	1	T60-1540K	BTS-150K	
R91	100KΩ	1	T60-1040K	BTS-100K	
R92	470KΩ	1	T60-4740K	BTS-470K	
R93	8200Ω	2	T60-8232K	BTS-8200	
R94	1000Ω	½		BTS-1000	
R95	2.2Ω	½	T60-2R2		
R96	470Ω	1	T60-4711K	BTA-470	Note 2
R97	68000Ω	2	T60-6832K	BTS-6800	
R98	10001Ω	2	T60-1032K	BTS-1000	
R99	2200Ω	15	T61-3		
R100	8000Ω	10	T61-4		Note 3
R101	140Ω	10	T61-2		Note 9
R102	7.5Ω	5	T43-1007		
R103	470KΩ	½	T60-4740K	BTS-470K	
R104	270KΩ	½	T60-2740K	BTS-270K	Note 10
R105	27KΩ	½	T60-2730K	BTS-27K	Note 11
R106	1000Ω	½	T60-1025K	BTS-1000	Note 10

* Items R70A, R70B, R70C, C63A, C63B and C63C are combined in one unit.
Note 1: Chassis 528.31700 uses a 82000 resistor in this application.
Note 2: Chassis 528.31700 uses a 1000Ω resistor in this application.
Note 3: Not used in chassis 528.31700.
Note 4: Some versions may use a 56Ω resistor in this application.
Note 5: Chassis 528.31700 uses a 180Ω resistor in this application.
Note 6: Chassis 528.31700 uses a 220Ω resistor in this application.
Note 7: Chassis 528.31700 uses a 2Meg resistor in this application.
Note 8: Chassis 528.31700 uses a 470KΩ resistor in this application.
Note 9: Chassis 528.31700 uses a 250Ω 10 watt resistor in this application.
Note 10: Not used in some versions.
Note 11: Used in chassis 528.33800, 528.33900, 528.34300 and 528.34600.

TRANSFORMER (FILAMENT)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA SILVERTONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordorson PART No.
T1	117VAC @ 1.08A	6.3VAC @ 3A	5.3VAC @ 7.5A	80-318						

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA SILVERTONE PART No	Halldorson PART No.	Merit PART No.	RCA PART No	Ram PART No.	Stancor TYPE No	Thordorson PART No.	Triad PART No.
T2	Vert. Osc. Trans.	T80-317	B6702 ①	A-3003 ①	209T1 ①	V405 ①	A-8125 ①	24A87 ①	A-97X ①
T3	Horiz. Output Trans.	T80-320	F3411 ①	HV0-1* ①	230T1* ①	X080* ①	A-8233* ①	FLY-34* ①	D-1* ①
T4	Vert. Output Trans.	T80-316	B1805 ①	A-3038 ①	228T1 ①	V313 ①	A-8141 ①	24S54 ①	A-104X ①
T5A	Yoke-Horiz. (23MH)	T10-673 ②	DF-505 ③	MDF-73 ③	222D4 ③ ④	Y10P20/43 ③	DY-11A ③	Y-10 ③ ⑤	Y-19-1 ③
B	Vert. (38MH)	T21-218 ②							

① Drill new mounting hole(s).
② Chassis 528.34600 and 528.34603 use part no. T10-696 in this application. Some chassis may use part no. T10-682 in this application.
③ Use original yoke cover and centering device.
④ Remove damping capacitor from terms #1 and #2. Use original horizontal network, if necessary.
⑤ Connect horizontal damping network across in terminals #3 and #7. Use original damping network, if necessary.
⑥ See instructions packed with unit pertaining to yoke damping network.
⑦ Yoke cover and centering device.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordorson Replacement Connections	Triad Replacement Connections
4	9	9	9	9	7	9	9
5	8	8	8	T & R	6	8	8 & 7
3	3	3	3	3	4	3	3
1	1	1	1	1	3	1	1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI	IMPEDANCE SEC	REPLACEMENT DATA SILVERTONE PART No	Stancor PART No	Merit PART No	Triad PART No.	Halldorson PART No	Thordorson PART No.	NOTES
T6	5.8KΩ	3.3Ω	80-319	A-3878 ①	A-3028	S-6X	Z1006 ①	22S47	① Drill one new mounting hole.

SPEAKER

ITEM No	RATINGS SIZE	RATINGS FIELD	RATINGS V C IMP	REPLACEMENT DATA SILVERTONE PART No	JENSEN PART No	QUAM PART No	NOTES
SP1	4"	PM	3.2Ω	79-439	ST-413 Mod. P4-X	4A1	1 Used in models 5106, 5127A, 5117B, 5125D, 5107, 5115, 5117, 5127, 5107A, 5127C, 5125C, 5125A, 5117A, 5117C, 5125D, 5117D and 5127D
	5"	PM	3.2Ω	79-430 1	ST-105 Mod. P5-X	5A1	2 Used in models 5129D, 5131D, 5123, 5131, 5125, 5125C, 5129C, 5131D, 5129D, 5129A, 41292, 41312, 41292A and 41312A.
	6"	PM	3.2Ω	79-433 ②	ST-106 Mod. P6-X	6A1	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SILVERTONE PART No	MEISSNER PART No	MERIT PART No	MILLER PART No	NOTES
L1	UHF Ant. Coil	0Ω						
L2	UHF Ant. Coil	0Ω						
L3	UHF RF Coil	0Ω						
L4	UHF Ant. Coil	0Ω						
L5	UHF RF Coil							
	End Inductor	0Ω						
L6	UHF Ant. Coil							
	End Inductor	0Ω						
L7	UHF Mixer							
	Coupling Coil	0Ω						
L8	Fil. Choke	0Ω						
L9	Fil. Choke	0Ω						
L10	Cathode Choke	0Ω						
L11	UHF Osc. Coil	0Ω						
L12	UHF Osc. Coil							
	End Inductor	0Ω						
L13	UHF Osc. Coil							
	End Inductor	0Ω						
L14	UHF IF Coil	0Ω						
L15	UHF IF Coil	0Ω						
L16	UHF IF Coil	0Ω						
L17	RF Choke	.1Ω						
L18	UHF Intersteg Coil	0Ω						
L19	VHF Ant. Coils	0Ω CT	0Ω					
L20	Neut. Coil	0Ω						
L21	UHF Intersteg Coil	0Ω						Includes 5.6KΩ resistor
L22	VHF RF Mixer Grid & Osc. Coils	0Ω						
L23	Fil. Choke	0Ω						
L24	Conv Plate	.1Ω						
L25	1st. Video IF	0Ω		T10-680	17-5003 ▲	TV-137 ▲	6332 ▲	Includes 41.25MC trap-Note 1
L26	2nd. Video IF	0Ω	0Ω	T10-677	17-4630 *	TV-138	6233	Includes 47.25MC trap-Note 2
L27	3rd. Video IF	0Ω	0Ω	T10-678	17-5000	TV-135	6234	Note 2
L28	4th. Video IF	0Ω	0Ω	T10-679	17-5004	TV-125	6234	Note 3
L29	Series Peaking Coil	5.3Ω		T10-676	19-3125		6153	120 Microhenries
L30	Shunt Peaking Coil	11Ω		T10-590	19-3250	TV-185	6181	269 Microhenries
L31A	4.5MC Trap	2.4Ω						
B	Sound IF	3.4Ω		T10-674				
L32	Series Peaking Coil	10Ω		T10-671	19-4280	TV-188 +	6173	230 Microhenries, wound on 332Ω resistor
L33	Shunt Peaking Coil	11Ω		T10-590	19-3250	TV-185	6181	269 Microhenries
L34	Ratio Det.	3.7Ω	.3ΩCT	T10-652	17-1033 †	TV-136 †	3668 †	Tertiary winding - .8Ω
L35	Horiz. Osc.	19Ω	50Ω	T10-669	20-1402	TV-162	6183	Waveform winding -45Ω

Note 1. In chassis 528.31700 part no. T10-670 is used, 21.75MC trap includes (Miller part #6746).
Note 2. In chassis 528.31700 part no. T10-672 is used. (Meissner part 417-1063, Merit part #TV-136, Miller part #6348)
Note 3. In chassis 528.31700 part no. T10-675 is used. (Merit part #TV-100* . Miller part #6186 a).
* Cut out chassis hole and drill mounting holes.
▲ Cut out chassis hole and drill mounting holes - detune trap.
+ Parallel with 22KΩ resistor.
† Drill mounting holes and disconnect capacitor across primary winding.
△ Use one winding only.

SELENIUM RECTIFIER

ITEM No	RATING CURRENT	REPLACEMENT DATA SILVERTONE PART No	FEDERAL PART No	INTERNATIONAL PART No	MALLORY PART No	RADIO RECEPTOR PART No	SARKES TARZIAN PART No	NOTES
M1	.35ΩA	83-819	1090A	RS300	S8300	6A4	300	
M3	.35ΩA	83-819	1090A	RS300	S8300	6Q4	300	

CRYSTAL DIODES

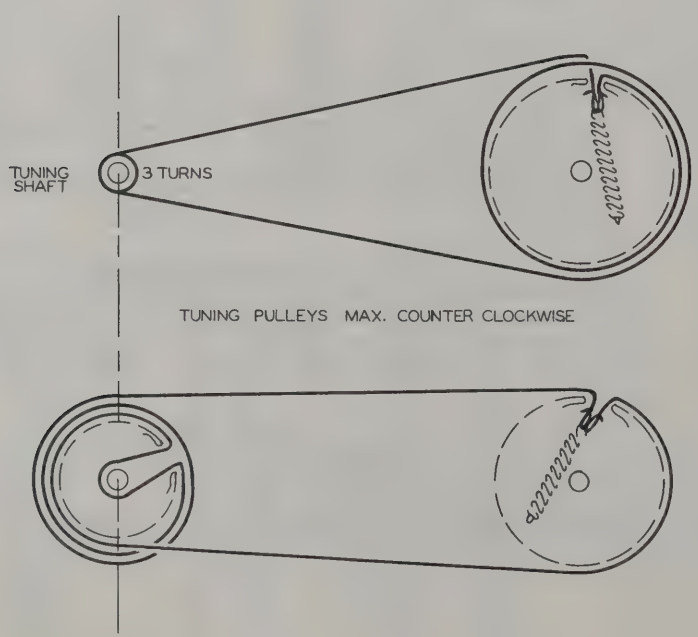
ITEM No	ORIG TYPE	REPLACEMENT DATA SILVERTONE PART No	SYLVANIA PART No	NOTES
M3	1N82	T90413-1	1N82 or 1N82A	UHF Mixer

SILVERTONE MODELS 5101, A, 5106, 5107, A, 5112, A, C, 5115, A, B, C, D, 5117, A, B, C, D, 5123, 5127, A, B, C, 5129, A, B, C, D, 5131, A, B, C, D, 41112, A, 41312, A (Ch. 528.31500, 528.31600, 528.31700, 528.31800, 528.31900, 528.34300, 528.34600, 528.34601, 528.34602, 528.34603)

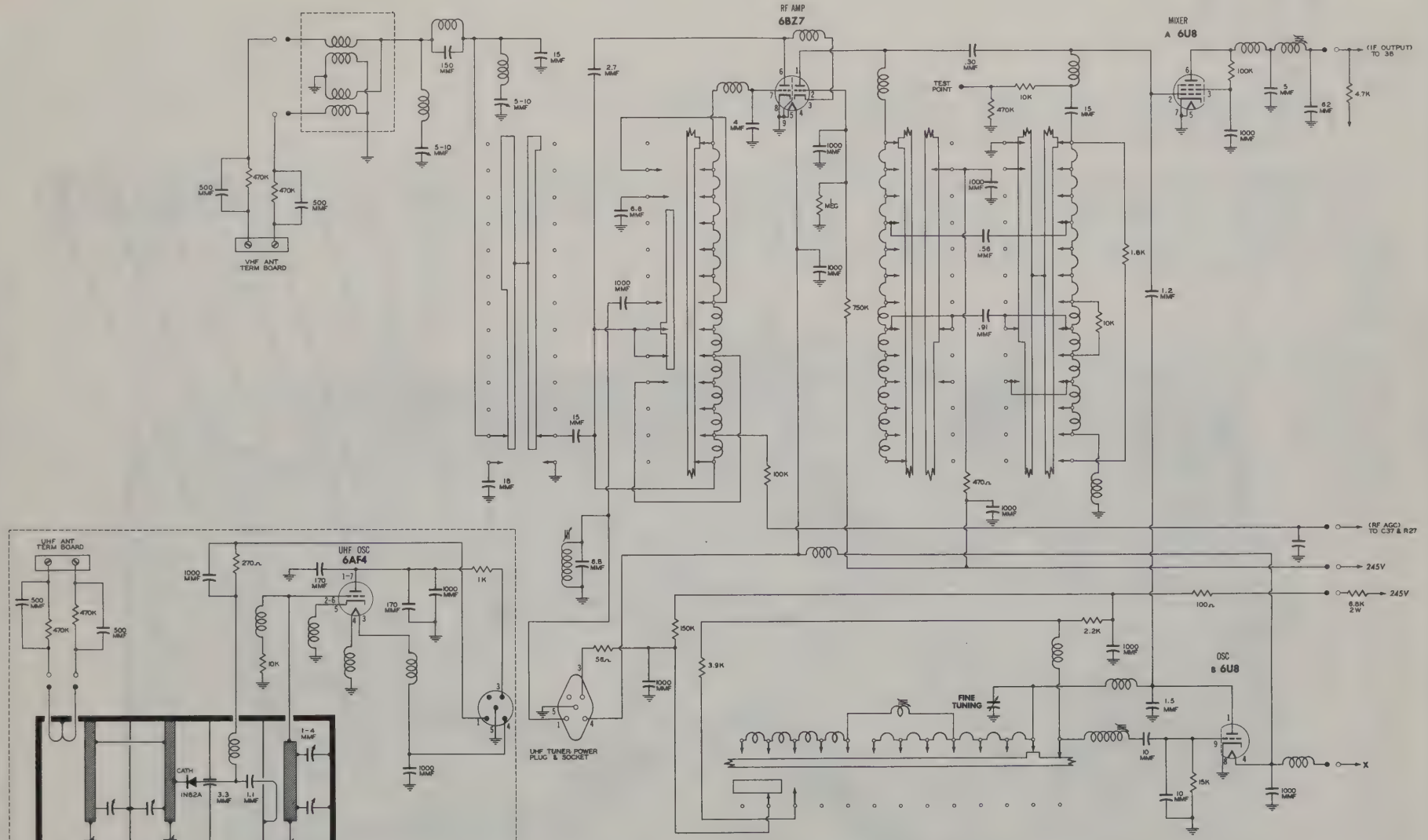
PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M4	Tuner	T95-41	VHF - Ch. 528. 31500 & 528. 31600
M5	Tuner	T95-40	UHF - Ch. 528. 31500 & 528. 31600
M6	Tuner	T95-44	All Channel VHF-UHF - Ch. 528. 33800, 528. 33900, 528. 34200, 528. 34600, 528. 34601, 528. 34602 & 528. 34603
M7	Tuner	T95-39	VHF Ch. 528. 31700
M8	Trap	T21K-225-01	VHF Ant. Input Filter - Ch. 528. 31500 & 528. 31600 only.
M9	Centering Device	T21-218	
M10	Ion Trap	T83-830	
B3	Trimmer Cap.	T20-152	Horiz. Range (9-180MMF)
	Cabinet	T42-698	Model 5101A
	Cabinet	T42-678	Model 5107
	Cabinet	T42-700	Model 5112A
	Cabinet	T42-680	Models 5115 & 5115B
	Cabinet	T42-681	Models 5117 & 5117B
	Cabinet	T42-707	Model 5125
	Cabinet	T42-703	Model 5127A
	Cabinet	T42-704	Model 5129A & 41292
	Cabinet	T42-686	Models 5129B, 41292A & 5129
	Cabinet	T42-693	Models 5131B, 41312A & 5131
	Cabinet	T42-706	Model 41122
	Cabinet	T42-699	Model 5107A
	Cabinet	T42-708	Model 5127B
	Cabinet	T42-679	Model 5112
	Cabinet	T42-685	Model 5127
	Cabinet	T42-677	Model 5101
	Cabinet	T42-705	Model 41312
	Cabinet	T42-712	Model 5115C
	Cabinet	T42-713	Models 5129C & 5129D
	Cabinet	T42-714	Model 5117C
	Cabinet	T42-715	Models 5131C & 5131D
	Cabinet	T42-716	Model 5112C
	Cabinet	T42-721	Model 5127C
	Cabinet	T42-730	Model 5115D
	Cabinet	T42-731	Model 5117D
	Cabinet	T42-671	Model 5106
	Safety Glass	T48-96	Models 5112C & 5127C
	Safety Glass	T48-88	Models 5101A & 5101
	Safety Glass	T48-87	Models 5107, 5107A & 5106
	Safety Glass	T48-89	Models 5112A, 5127A, 41122, 5127B, 5112, & 5127
	Safety Glass	T48-90	Models 5115, 5115B, 5117, 5117B, 5129B, 5131B, 41292A, 41312A, 5129 & 5131
	Safety Glass	T48-94	Models 5125, 5129A, 41292 & 41312
	Safety Glass	T48-95	Models 5115C, 5129C, 5117C, 5131C, 5115D, 5129D, 5117D & 5131D
	Mask	T31-263	Models 5101A & 5101
	Mask	T31-264	Models 5107, 5107A & 5106
	Mask	T31-262	Models 5112A, 41122 & 5112
	Mask	T31-261	Models 5115, 5115B, 5117, 5117B, 5129, 5131, 5129B, 5131B, 41292A & 41312A
	Mask	T31-274	Model 5125
	Mask	T31-268	Models 5127A, 5127B & 5127
	Mask	T31-275	Models 5129A, 41292 & 51312
	Mask	T31-276	Models 5115C, 5129C, 5117C, 5131C, 5115D, 5129D, 5117D & 5131D
	Mask	T31-277	Model 5112C
	Mask	T31-283	Model 5127C



UHF DRIVE CORD STRINGING



UHF-VHF TUNER PART NO. T95-44 USED WITH CHASSIS 528.33800, 33900, 34200, 34800, 34601, 34602, AND 34603

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ALTERNATE TUNER SCHEMATIC

TROUBLE SHOOTING AIDS (cont)

ERTY OF
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DENVER, COLORADO

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V13, V14, V15 and V16. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check T3, T5A, C6, C83, C80, R93 and other associated components.	Check L35, C76, C77, C79, R88, R83, R82, R4 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V14 and V15. Check M1 and M2. Check R102, R93, C6, C79 and other associated components.

BLOOMING

Check by substitution V14, V15 and V16. Check M1 and M2. Check R93, R102, C79 and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V2, V3, V4, V5, V6, V7 and V8. Check video IF components for failure or change of value. Raster, No Sound, No picture UHF, substitute V1.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

KEYSTONE EFFECT

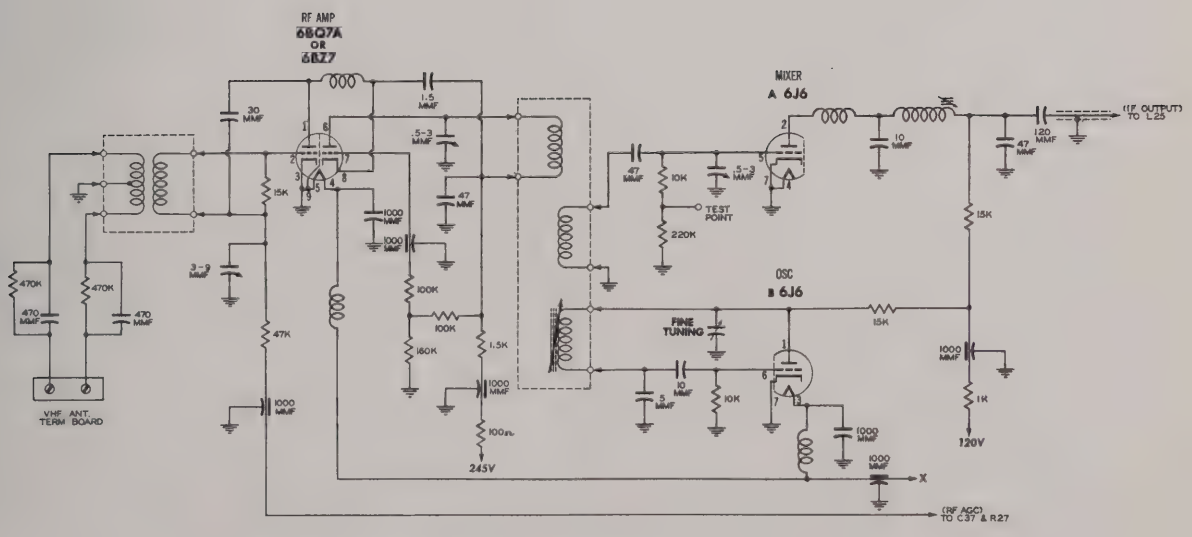
Check T5 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.

SILVERTONE MODELS 5101, A, 5106, 5107, A, 5112, A, C, 5115, A, B, C, D, 5117, A, B, C, D, 5125, 5127, A, B, C, 5129, A, B, C, D, 5131, A, B, C, D, 41122, 41292, A, 41312, A (Ch. 528.31500, 528.31600, 528.31700, 528.33800, 528.33900, 528.34200, 528.34600, 528.34601, 528.34602, 528.34603)



VHF TUNER PART NO. T95-39 USED WITH CHASSIS 528.31700

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ALTERNATE TUNER SCHEMATIC

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions.)

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions.)

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the horizontal hold control at the center of its range and adjust horizontal frequency slug (L35) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L34) located on top of the chassis. (See tube placement chart for location.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 7 push-on type control knobs and UHF dial from side panel of cabinet.
2. Remove 6 wood screws. Remove rear cover.
3. Remove 2 wood screws. Remove antenna bracket.
4. Remove 4 wood screws (and rubber feet) at the underside of cabinet.
5. Disconnect speaker leads.
6. Lift cabinet off of mounting board.
7. Remove 2 speaker nuts. Remove speaker.

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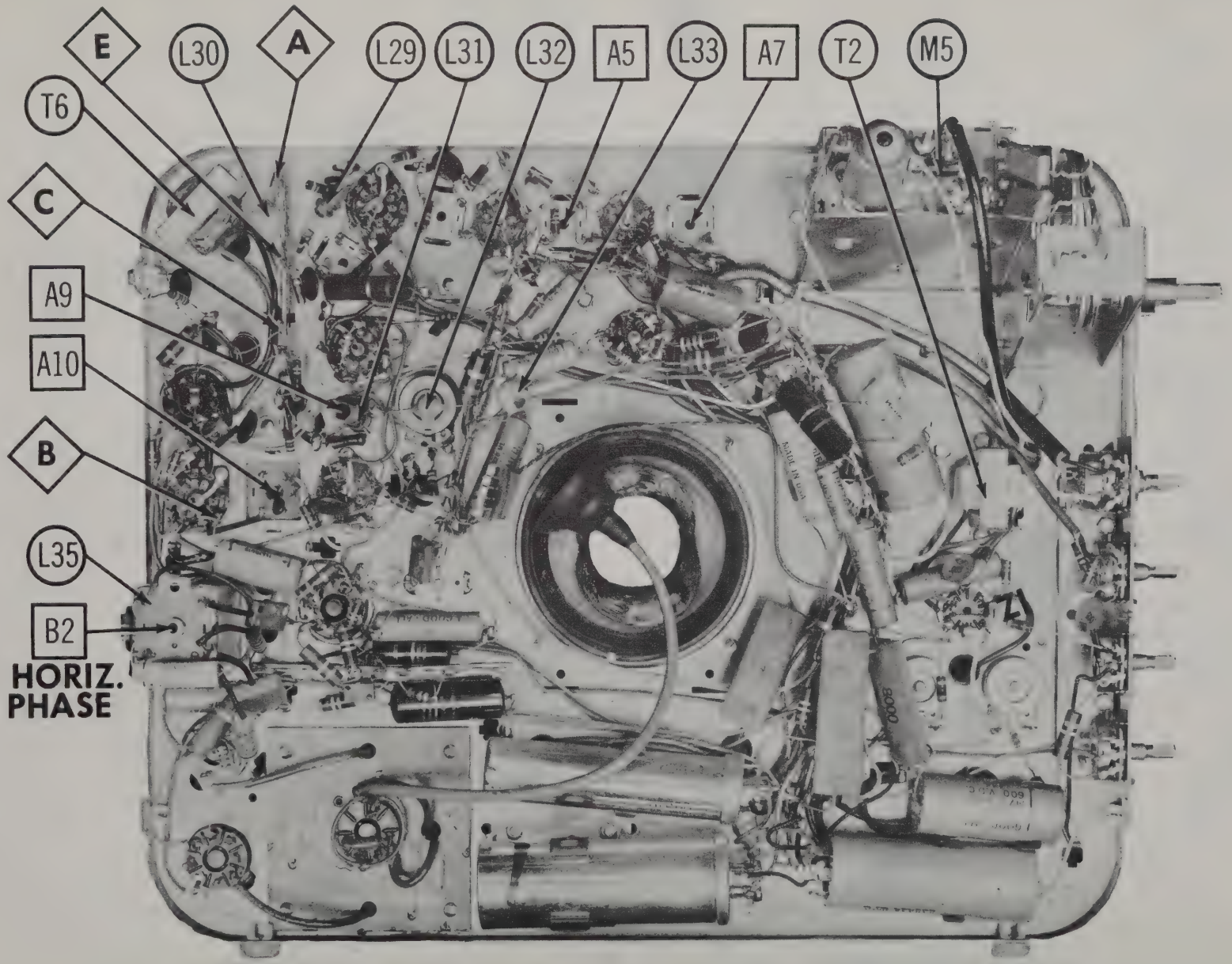
DENVER, COLORADO

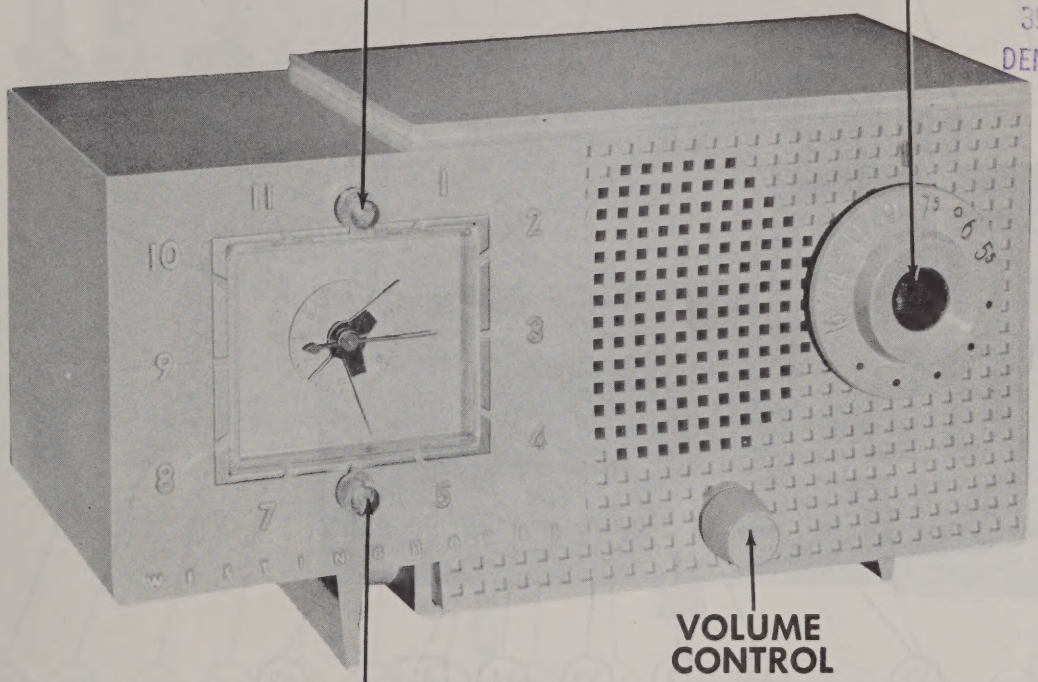


CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

WESTINGHOUSE MODELS H-471T5, H-472T5, H-473T5, H-474T5 (Ch. V-2184-5)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

WESTINGHOUSE MODELS H-471T5, H-472T5, H-473T5, H-474T5 (Ch. V-2184-5)



WESTINGHOUSE MODELS H-471T5, H-472T5, H-473T5, H-474T5 (Ch. V-2184-5)

TRADE NAME	Westinghouse Models H-471T5, H-472T5, H-473T5, H-474T5 (Ch. V-2184-5)
MANUFACTURER	Westinghouse Electric Corp., TV-Radio Div., Metuchen, N.J.
TYPE SET	AC Operated AM Superheterodyne Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC-60 Cycles RATING .24 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	200MMF	High side to ant. terminal lug. Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1625KC	"	"	A5	"
3.		Loop	1400KC	1400KC	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det.-AVC-AF Amp.	12AV6	12AV6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Westinghouse PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	50	150	V-11611-1			TCD49	TDL-D50-150	FMD-1550	
B	50	150							
C2	10000		R2CC63Z5Z103P	DD-103	811-01	DC-511			
C3	2000		R2CC61Z5Z202P	DD-102	801-002	DC-522		C-1220	
C4A	220		♦V-10789-2	♦PC-151	♦1408-02				
B	5000								
C	5000								
D	250								
E									
C5	10000		R2CC63Z5Z103P	DD-103	811-01	DC-511	IMP6-S1	330611	
C6	.047	400	V-10157-4473M	DF-503		PT4147	IMP4-S47	3304147	
C7	.05	400	RCP10M4503M	DF-503		PT415	IMP4-S5	330415	

♦ Items C4A, C4B, C4C, C4D, C4E, R5A, R5B, R5C are combined in one unit.
When replacing items separately, C4D and C4E should total 250MMF.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Westinghouse PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	V9993V-10	Q13-133	A47-500K-Z	AB-60	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	22KΩ	½	RC20AE223M	BTS-22K	
R3	680Ω	½	RC20AE681M	BTS-680	
R4	3.3Meg	½	RC20AE335M	BTS-3.3Meg	

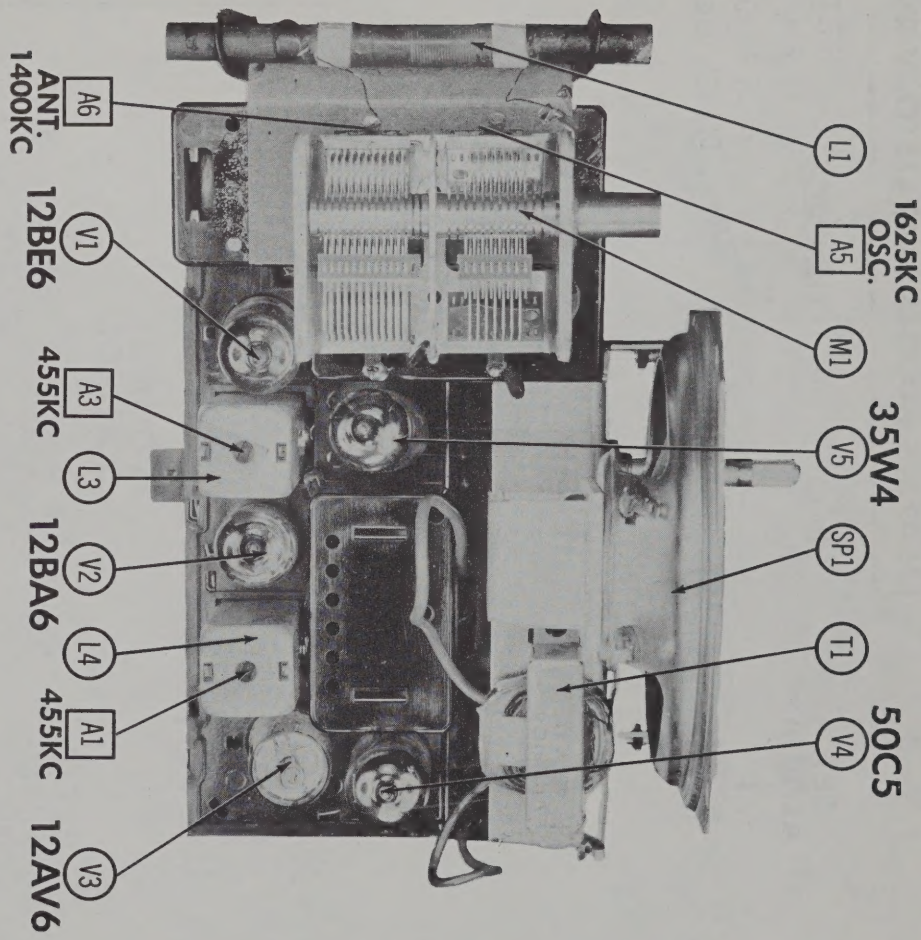
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Westinghouse PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R5A	6.8Meg	½	♦V-10789-2	BTS-6.8Meg	
B	470KΩ	½		BTS-470K	
C	470KΩ	½		BTS-470K	
R6	150Ω	½	RC20AE151M	BTS-150	
R7	1000Ω	1	RC30AE102M	BTA-1000	

♦ Items R5A, R5B, R5C, C4A, C4B, C4C, C4D and C4E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: Westinghouse PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	2KΩ	3.3Ω	V-11561C-1	A-3332	A-3025	S-12X	Z1101	26S58	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Westinghouse PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.3Ω	V-11554-1	ST-113 Mod. P4-X	4A07	

COILS (RF-IF)

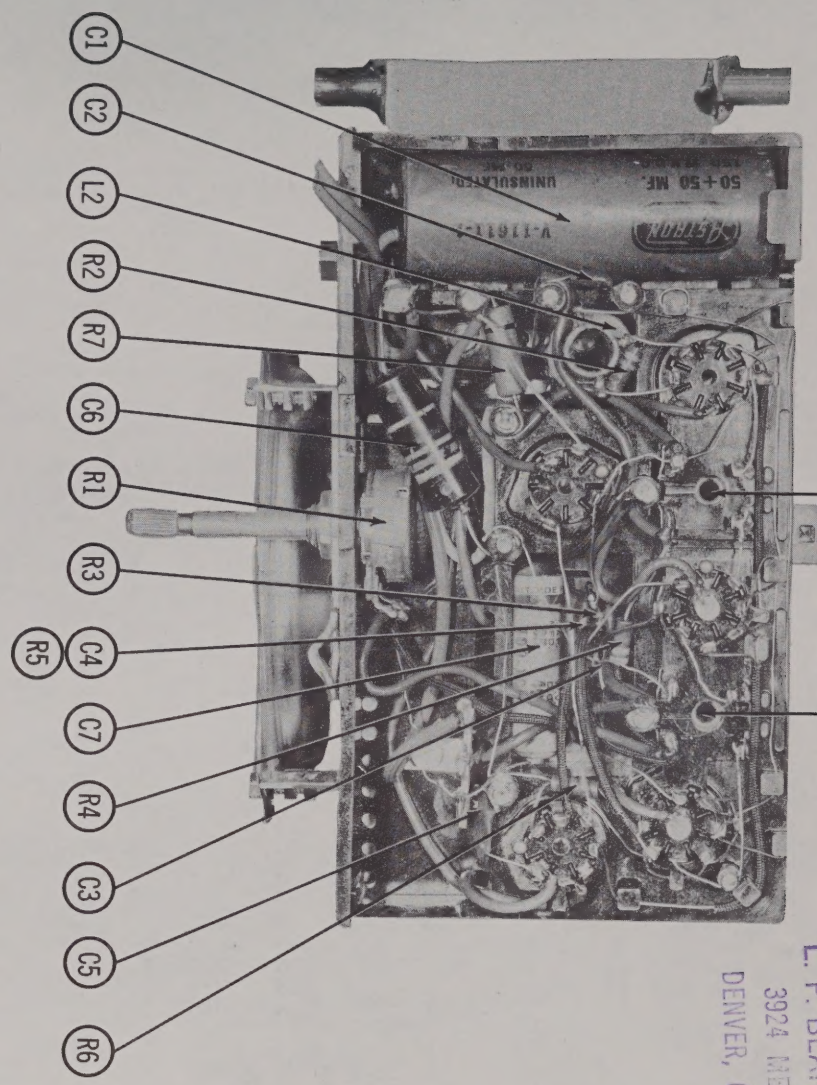
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Westinghouse PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.7Ω		V-11550-3				
L2	Osc. Coil	.9Ω	12Ω	V-11555-1			69-OSC †	Westinghouse part no. includes R2
L3	Input IF	16Ω	16Ω	V-11579-1	16-6758	BC-352	12-C1	
L4	Output IF	16Ω	16Ω	V-11579-1	16-6758	BC-353	12-C2	

† Leads have sufficient mounting support.

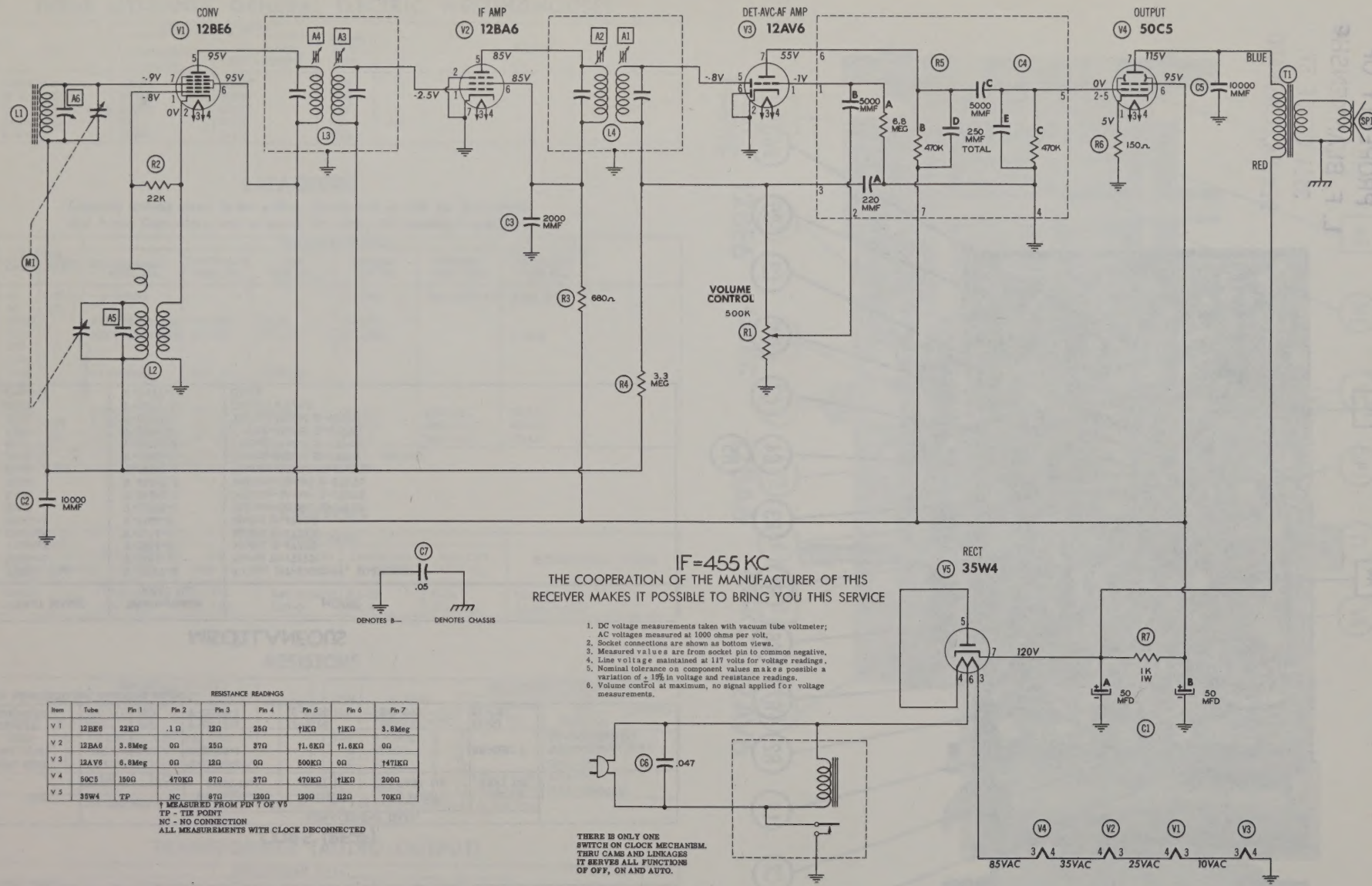
MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M1	Tuning Cap.	V-11277-3	2 Gang (37-405MMF, 17-110MMF)
	Cabinet	V-1364-1	Model H-471T5
	Cabinet	V-1364-2	Model H-472T5
	Cabinet	V-1364-3	Model H-473T5
	Cabinet	V-1364-4	Model H-474T5
	Knob	V-14483-1	Volume-Model H-471T5
	Knob	V-14483-2	Volume-Model H-472T5
	Knob	V-14483-3	Volume-Model H-473T5
	Knob	V-14483-4	Volume-Model H-474T5
	Knob	V-14481-1	Tuning-Model H-471T5
	Knob	V-14481-2	Tuning-Model H-472T5
	Knob	V-14481-3	Tuning-Model H-473T5
	Knob	V-14481-4	Tuning-Model H-474T5
	Knob	V-11573-1	Clock (2 used)
	Crystal	V-11477-1	Clock

CHASSIS—BOTTOM VIEW



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



IF=455 KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.1 Ω	12Ω	25Ω	†1KΩ	†1KΩ	3.8Meg
V 2	12BA6	3.8Meg	0Ω	25Ω	37Ω	†1.6KΩ	†1.6KΩ	0Ω
V 3	12AV6	6.8Meg	0Ω	12Ω	0Ω	500KΩ	0Ω	†471KΩ
V 4	50C5	150Ω	470KΩ	87Ω	37Ω	470KΩ	†1KΩ	200Ω
V 5	35W4	TP	NC	87Ω	120Ω	120Ω	112Ω	70KΩ

† MEASURED FROM PIN 7 OF V5
TP - TIE POINT
NC - NO CONNECTION
ALL MEASUREMENTS WITH CLOCK DECONNECTED

THERE IS ONLY ONE SWITCH ON CLOCK MECHANISM. THRU CAMS AND LINKAGES IT SERVES ALL FUNCTIONS OF OFF, ON AND AUTO.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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